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References (1) Altemeier, W. A.; Culbertson, W. R.; Sherman, R.; Cole, W.; Elstun, W., & Fultz, C. T.: *J.A.M.A.* 157:305 (Jan. 22) 1955. (2) Austrian, R.: *New York J. Med.* 55:2475 (Sept. 1) 1955. (3) Murphy, F. D., & Waisbren, B. A., in Murphy, F. D.: *Medical Emergencies: Diagnosis and Treatment*, ed. 5, Philadelphia, F. A. Davis Company, 1955, p. 557. (4) Weil, A. J., & Stempel, B.: *Antibiotic Med.* 1:319, 1955. (5) Jones, C. P.; Carter, B.; Thomas, W. L., & Creadick, R. N.: *Obst. & Gynec.* 5:365, 1955. (6) Kass, E. H.: *Am. J. Med.* 18:764, 1955. (7) Tebrock, H. E., & Young, W. N.: *New York J. Med.* 55:1159 (Apr. 15) 1955.



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Volume LVIII

JANUARY, 1957

No. 1

Focal Epilepsy

*Surgical Findings in 43 Selected Patients and Reports on Six Cases of Special Interest**

RALPH L. DRAKE, M.D., JAMES S. HIBBARD, M.D.,**
and LARRY VIN ZANT, M.D., *Wichita*

Approximately 750,000 individuals in the United States today suffer from epileptic seizures, one of the oldest recorded diseases and one which has puzzled doctors from the earliest times.

We wish to call attention to the newer concepts of the epileptic state and then to report our experience with the surgical treatment of 43 selected cases, each of which presented clinical seizures uncontrolled by medication.

Through the use of newer techniques and clinical advancement, our conception of the epilepsies has greatly changed in the past ten years. This increased knowledge has brought out a more practical classification, as suggested by McNaughton:¹

1. *Focal epilepsy* which includes all cases with focal electro-encephalographic findings and clinical focal seizure patterns.

2. *Central epilepsy* arising from diencephalon and midbrain, showing three-per-second wave and spike discharges bilaterally. Major or minor seizures and myoclonic jerks characterize this group clinically.

3. *Epilepsy, unlocalized with known cause*: The electro-encephalogram shows generalized disturbance. In this group are (1) diffuse cerebral lesions as encephalitis, trauma, degenerative diseases, (2) general causes as hypoglycemia, cerebral anemia, and anoxia.

4. *Epilepsy, unlocalized, due to unknown causes*.

5. *Temporal lobe (psychomotor) epilepsy*, still unclassified.

In the study of epileptic patients there are two objectives to be attained. The first is to locate the epileptogenic lesion or focal area of discharge, considered at present to be the active etiologic factor, and the second to determine its nature.

According to the latest concept the epileptogenic lesion, located within the central nervous system, causes a periodic discharge of neurones resulting in the epileptic seizure.

Newer concepts of treating epilepsy are discussed. Surgical therapy should be limited to those amenable to surgery and who do not respond favorably to antiepileptic drugs. Gratifying results obtained by surgical therapy in well selected cases justify the operation. At times removal of the "epileptogenic focus" constitutes a life-saving measure.

This abnormal focus, or seat of discharge, consists of an area of focal ischemia which occupies an intermediate zone between the area of the cortex, completely cut off from its circulation by the pathologic process, and normal grey matter.

This area of focal ischemia which sets off neuronal discharges, according to Penfield,² also produces simultaneous secondary alteration in intracerebral circulation. The neuronal discharges are conducted through neuron circuits gradually setting up an "epileptic pattern" through repeated conduction.

*From Departments of Neurology and Neurosurgery, Wesley Hospital, Wichita.

**Deceased.

Pathological Features

The epileptogenic lesions from the pathological standpoint are grouped generally into expanding lesions and atrophic lesions.

It is well recognized that expanding lesions such as abscesses and other space-occupying lesions commonly cause epileptic seizures. It has been observed by Penfield² that the closer this type of lesion lies to the sensorimotor cortex, the more apt it is to produce epileptic seizures. Furthermore, the more slowly growing lesions show a greater incidence of seizures, while rapidly expanding lesions as cerebral hemorrhage and acute brain abscess cause epileptic seizures of a transient character.

The second type of epileptogenic lesion, the atrophic form, comprises the meningocerebral scar and the simple atrophic lesions.

The meningocerebral scar is made up of adhesions between dura and brain in which blood vessels and connective tissue extend across the subdural space. Such scars are the result of lacerated wounds of dura and brain, "healed" abscesses, or local meningeal infections. In the case of such scar formation it is the intermediate zone, between the scar and normal brain tissue, which undergoes progressive destruction and acts as the focal area of discharge.

In contradistinction to the meningocerebral scar which occurs usually in adult life, the simple atrophic lesions arise from diseases or injuries occurring from the prenatal period to the first few years of postnatal life. During these periods one of the larger cerebral arteries may become occluded with loss of brain substance in its area of supply. Evagination of the ventricle into the vacant space occurs with enlargement of ventricular walls forming a cyst or unilateral hydrocephalus.

Thrombosis of cerebral veins occurring in febrile illnesses produces partial atrophy of one of more gyri which act as focal lesions. Likewise, the site of cerebral hemorrhage may be a focal epileptogenic area in which an abnormal gyrus in the neighborhood of the cystic area acts as a focus.

During birth the brain is often subjected to anoxemia causing lack of normal growth in a localized area. In such cases normal gyri grow into this atrophic area without accompanying ventricular enlargement as in the larger lesions. Occasionally hemangiomas or aneurysms may produce focal lesions by local pressure on one or more gyri.

In summary, it should be remembered that there are features which all forms of atrophic epileptogenic lesions have in common. These are an aganglionic area in the center of the lesion and an adjoining intermediate zone where grey matter is gradually undergoing destruction and which acts as the area of re-

curing ganglionic ischemia that Penfield considers the active agent of epileptic discharge.

The recognition and treatment of these focal epileptogenic lesions in infancy and childhood is of great importance if we are to prevent the occurrence of seizures later in life, thus avoiding the hazardous conditions under which these patients live.

Clinical Features

When a patient suffering from some type of seizure presents himself for examination, the most important fact to determine is the exact location of the exciting cause. For such investigation a definite procedure is followed. This consists of the clinical history, neurologic examination, electro-encephalographic study, x-ray of skull, and pneumoencephalogram or pneumoventriculogram.

As in other forms of medical examination, the history is of utmost importance in the diagnosis of patients with seizures since most epileptogenic lesions can be localized fairly accurately by the history alone.

The most important fact to be obtained is the exact nature of the first symptom that ushers in the clinical seizure. Following this, it is necessary to learn of the progression of the seizure and what symptoms occur immediately following it.

Second in importance to the initial symptom of the seizure is knowledge concerning the nature of the activating agent. Information concerning the date of the first seizure is helpful in this respect.

If the initial seizure appears in the first year of life, birth injury or ischemia is the likely cause. In the first decade those causes just mentioned and others such as congenital lesions, centrencephalic disturbances, cerebral degenerations, and infectious processes play a prominent role. In the second decade trauma and febrile thromboses are added important causative factors.

After the second decade temporal lobe epilepsy and trauma play an important role, and after 25 years of age brain tumor is added to the list of causative factors. Cerebral arteriosclerosis becomes an important factor in advanced years.

The neurologic examination at times reveals lack of growth on one side of the body with hemiatrophy and associated smallness of the cranium on the same side as the lesion.

Observation of the clinical seizure by the examiner is of added value when such opportunity presents itself. Many times this is not possible, and the examiner must resort to such procedures as hyperventilation, hydration, metrazol injection alone, or in combination with photic stimulation, each of which can be carried out at the time of the electroencephalographic examination.

The electro-encephalograph is an important aid in our understanding of the epileptic patient as it gives an electrical pattern of neuronal activity. This must be interpreted in the light of other clinical data to make a diagnosis of epilepsy. From the electro-encephalogram we gain information as to what type of epilepsy is present and, in many cases, an accurate localization of the discharging focus. It gives us not only a record of what occurs at the time of the seizure but also of the abnormal cortical activity occurring in the inter-seizure period. A normal electro-encephalogram may be obtained in approximately 15 per cent of patients known to have epilepsy.

In cases where the above-mentioned procedures are not helpful in establishing a diagnosis, an air encephalogram or ventriculogram is useful as a further aid in localization. At times cerebral angiography is used if one suspects a vascular lesion.

If the patient comes to operation, an electro-encephalographic tracing is made from the exposed cortex and localization further demonstrated by spike discharges considered to be electrical evidence of the activity of the epileptogenic lesion.

Further aid in localization is carried out at operation when the cortex is stimulated electrically in an attempt to reproduce the clinical seizure.

The initial symptom of the clinical seizure may appear in one of several forms as motor, sensory, autonomic, psychical, or primary loss of consciousness.

The initial symptoms in our group of 43 surgically treated patients are as follows:

| | |
|----------------------------------|---|
| 1. Somatic Motor Seizures | |
| A. Jacksonian (Rolandic) | 5 |
| B. Aphasia (Motor) | 1 |
| C. Adversive Seizures | |
| 1. Conscious | 5 |
| 2. Unconscious | 7 |
| D. Supplementary Motor | 2 |
| 2. Somatic Sensory Seizures | |
| A. Visual | 1 |
| B. Vertiginous | 2 |
| 3. Autonomic Seizures | |
| A. Viscero-Sensory | 4 |
| B. Viscero-Motor | 1 |
| 4. Psychical Seizures | |
| A. Illusion | |
| 1. Illusion of Body Size | 1 |
| B. Hallucination | |
| 1. Visual | 1 |
| 2. Auditory | 1 |
| C. Fear | 1 |
| 5. Initial Unconsciousness | 7 |
| 6. Automatism | |
| A. Frontal | 1 |
| B. Temporal (Psychomotor) | 3 |

In our series adverse movements comprised the majority of initial symptoms. This group occurs in association with lesions situated anterior to the pre-central gyrus. The seizure begins with a turning of the head, eyes, and body to the side opposite the lesion (with rare exceptions to the same side). When the lesion lies in the intermediate frontal area, adverse movements occur without an initial loss of consciousness; on the other hand, when the lesion occurs further anteriorly in the frontal lobe, unconsciousness is present at time of seizure or preceding it.

Temporal Lobe Seizures

The most common site for focal epilepsy lies in the temporal lobe. Such localization was not so frequent in our cases because of our lower age group. In our series the youngest was five weeks and the eldest was 43 years of age, with an average mean of 17 years.

Although the clinical features of temporal lobe epilepsy are variable, one frequent symptom is "automatism." The state of temporal automatism occurring without preceding sensory manifestations (ictal automatism) results from stimulation of the periamygdaloid area producing the syndrome of furtive searching, staring, and tonic body movements. However, in spontaneous seizures of man involving the temporal area, automatism is usually preceded by symptoms of sensory or psychic nature. The most common aura is a sensation in abdomen, thorax or throat; at times auditory, vertiginous, and olfactory auras may appear first. Any of these, then, may be followed by the state of automatism with or without masticatory movements or manifestations of cortical disturbance outside of the temporal area.

Prominent among sensory symptoms of temporal lobe epilepsy is the psychical hallucination. One of our patients, under medical therapy, has as her initial symptom a visual hallucination in which, while walking along a narrow wall, she approaches a cherry-red heated stove placed in her path. As she attempts to pass around the stove she visualizes her dress catching on fire, after which she becomes unconscious with generalized tonic-clonic movements. These seizures have responded to drug therapy.

While automatism is considered the most constant feature of temporal lobe seizures, it may arise from other areas of the brain, as from one frontal lobe or centers in the mid-brain and diencephalon. The latter type shows no complicated motor acts as seen in temporal lobe automatism. In the temporal lobe type the patient may indulge in some form of involuntary activity as undressing or some other motor activity, often becomes angry if opposed, and may speak in unintelligible language.

One of our patients (A. E.), referred by Dr. F. Poling, Wichita, illustrates this type of seizure. A male, age 28, who had had several head injuries, developed seizures beginning with a staring expression after which automatism developed. On several occasions while eating in a restaurant he arose and walked upon the counters, with resulting amnesia for the entire period. At another time while attending a lecture in college he left the room, filled his pockets with pencils, and returned with no memory of the act. This patient at operation showed atrophy of the middle and posterior portions of the right temporal lobe with spike discharge from the middle gyrus.

Another rare and interesting type of seizure is that precipitated by listening to music of various forms. One of our medically treated patients comes under this category. A female, age 51 years, developed seizures at the age of 35, characterized by sudden loss of consciousness associated with masticatory movements. Six years later she noticed that her seizures were initiated by hearing music, especially of string instruments which had a vibrating quality. This type of seizure is probably temporal in origin.

Predisposing Factors

We have been impressed by the fact that extreme nervous and physical exhaustion, alcoholism, and exposure to extremes of temperature are strong predisposing factors in the production of seizures. We have recently had under medical treatment a man of 47 who, after a long period of physical and nervous strain, developed olfactory hallucinations of a strong unpleasant odor lasting a few seconds. This tended to recur at almost daily intervals and on one occasion was immediately followed by an auditory hallucination in which he heard familiar music sung by a man and woman. In most instances the odor was accompanied or immediately followed by motor aphasia. The electro-encephalogram showed focal cortical discharge of spikes and sharp waves in the left temporal and central areas. This patient apparently has a latent form of focal epilepsy since he has shown no signs of space-occupying lesion, had had no seizures previously, and has had none since medical treatment was instituted.

In this patient one may postulate an epileptogenic lesion in the region of the uncus with spread to the left temporal lobe producing motor aphasia (temporal) and the auditory hallucination. We believe the nervous and physical strain was the provocative factor.

Case Reports

Of the 43 patients treated surgically, six are of sufficient interest to warrant detailed description.

Illustration of the corticogram is given in two cases.

Case 1, M. C., a 25-year-old right handed female, was normal at birth. At age 17 she developed seizures beginning with loss of consciousness associated with generalized tonic-clonic movements. Seizures of this type occurred at irregular intervals up to one year before admission when their character changed. At that time they began as a dream state with visual hallucination in which she saw a woman leading a young girl by the hand, both of whom entered her left visual field and passed to the right. This was followed in a few seconds by turning of head and eyes to the right, unconsciousness, and generalized tonic-clonic movements. At other times the seizures began with a ringing noise in both ears followed by unconsciousness and generalized seizures. Medication did not control seizures.

A scalp electro-encephalogram showed sharp wave and spike discharges in the left parietal area. An air encephalogram showed a mild degree of atrophy in the posterior portion of the left cerebral hemisphere. A corticogram showed high voltage spike and wave discharge over the middle and posterior portion of the left superior temporal gyrus and left superior and inferior parietal areas (Figure 1). At operation on January 24, 1952, a cortical scar was found in the posterior temporal and anterior portion of the left occipital areas. The cortex of the posterior and middle portions of the superior temporal gyrus and left superior and inferior parietal areas was removed.

Postoperative course: She has had no seizures for

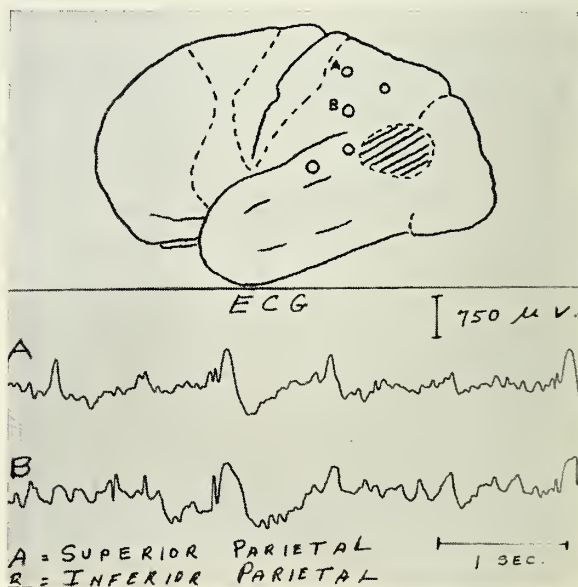


Figure 1. Case 1. Shaded area shows cerebral scar. Circles indicate areas of abnormal cortical discharge. Corticogram is shown below in monopolar setting.

more than four years and no medication since operation.

The initial symptoms of dream state and, on other occasions, ringing in both ears, are signs of temporal lobe involvement.

Case 2, R. E., an eight-year-old right handed male, was normal at birth. At age six he developed seizures beginning with turning of head and eyes to the left, followed by clonic movements of the left upper and lower extremities. These occurred an average of seven times daily and were uncontrolled by medication.

Neurologic examination showed horizontal nystagmus to the left. A scalp electro-encephalogram showed high voltage spike, and spike and wave discharge in all leads from the right hemisphere, initiated in the right motor area. A skull x-ray was normal. A ventriculogram showed moderate dilatation of the anterior horn and the body of the right lateral ventricle. A corticogram showed spike and wave focus in the right premotor and frontal areas (Figure 2).

At operation a dollar-sized scar with vascular adhesions from cortex to dura was found. This area extended forward $2\frac{1}{4}$ inches from the anterior portion of the precentral gyrus. The scar was excised, and the premotor cortex was ablated as well as frontal areas showing spike discharge.

Postoperative course: Seizures have gradually diminished since operation. During 1955 he had four mild seizures similar to those prior to operation and, so far in 1956, he has had one seizure. He has had no medication since operation.

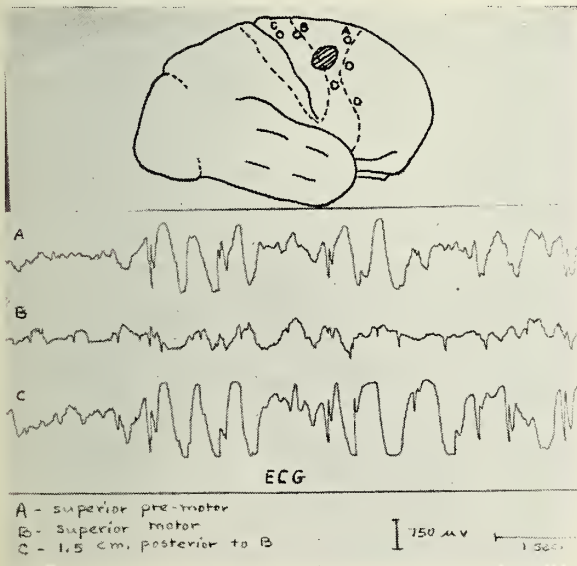


Figure 2. Case 2. Shaded area shows cortical scar. Circles indicate abnormal cortical discharge areas. Corticogram is shown below in monopolar setting.

Case 3, B. C., a 25-year-old right handed female, was normal at birth. At 21 years of age she developed seizures beginning with unconsciousness, turning of head and eyes to the right, and generalized tonic-clonic movements. Four years later she developed seizures starting with an auditory hallucination. On several occasions she heard, "A refrigerator! Be still! Be still! Feels as if someone is inside of me making this noise. It is a man's voice." This hallucination appeared as an ictal phenomenon and lasted five minutes. Medication did not control the seizures.

Neurologic examination was normal. A scalp electro-encephalogram showed high voltage four and five per second spike and wave discharges synchronously in all leads. An x-ray of the skull was normal. An air encephalogram showed slight dilatation of the body of the left lateral ventricle. A corticogram showed phase-reversal spikes in the left anterior and middle temporal areas. There was negative spike discharge in the left frontal and intermediate frontal.

Operation on May 27, 1952, showed two cystic areas in the left premotor area. The tip and inferior portions of the middle temporal gyrus on the left were fibrous and leathery. The left temporal lobe was removed from the tip posteriorly to a line corresponding to the central fissure. Cortex of frontal and intermediate frontal gyri in the neighborhood of the cystic areas was ablated.

Postoperative course: Since operation she has had generalized seizures on an average of one or two every three months. She has remained on medication since the operation.

Case 4, N. P., a 21-year-old left handed male, normal at birth, was referred by Dr. F. Poling, Wichita. At the age of 15 months he developed encephalitis with subsequent right hemiparesis and motor dysphasia. When he was eight he began having seizures with unconsciousness and turning of head and eyes to the right, followed by generalized tonic-clonic movements. During the two months before admission he had had two episodes of status epilepticus.

Neurologic examination showed smaller upper and lower extremities on the right than on the left with a spastic right-sided hemiparesis. There was motor dysphasia. The left side of the skull was smaller than the right. A scalp electro-encephalogram showed lower amplitude in the left occipital than on the right. An air encephalogram showed atrophy of the left cerebral hemisphere with cystic arachnoiditis.

At operation on October 9, 1951, the entire left cerebral hemisphere was found to be fibrous and cystic. A left-sided hemispherectomy (corticotomy) was performed with preservation of thalamus and caudate N.

Postoperative course: Since operation he has had no seizures and no medication. Use of right arm and leg has improved and he also shows greater facility in speech.

In this case the left hemisphere was affected before speech was established, and speech representation occurred in the right hemisphere. The smallness of his skull on the left is the result of early brain destruction on the same side.

Case 5, W. W., a 32-year-old right handed female, was normal at birth. When she was 25 she developed seizures beginning with unconsciousness associated with generalized tonic-clonic movements. These continued for two years, after which seizures began with unconsciousness followed by adverse movements to the left. Recently she had experienced seizures limited to a feeling of unreality, and at other times she had an illusion that her arms and legs were much larger than normal. Seizures occurred several times daily without relief from medication.

Neurologic examination, a scalp electro-encephalogram, and skull x-ray gave normal results. A corticogram was taken and spike discharges were obtained from the anterior temporal region on the right.

Surgery on June 5, 1952, showed sclerosis of the anterior portion and the tip of the right temporal lobe. The right temporal lobe was excised from the tip backward to a line corresponding to the central fissure.

Postoperative course: She has averaged only one nocturnal seizure every four months since operation. She has taken only one grain of phenobarbital irregularly at bedtime.

Doubtless this patient has other foci of cortical discharge most likely in the right frontal area, which are causing occasional seizures. The results obtained so far do not justify another operation.

Case 6, D. S., a 21-year-old right handed female, was delivered with instruments. She was referred by Dr. C. L. Scuka, Wichita. At the age of 13 years she developed seizures, beginning with a prickling and numb sensation in the left hand and spreading to the left arm and face, followed by raising of left arm and turning of head and eyes to the left, resulting in unconsciousness. Seizures were not controlled by medication.

A scalp electro-encephalogram showed focal cortical disturbance in the right temporal region. A corticogram showed spike discharge in right middle and superior temporal gyri in mid portion.

Operation was performed on December 2, 1953, and no demonstrable pathology was seen. With stimulation of the cortex in the left arm area of the post-central gyrus, a clinical seizure was reproduced. Stimulation over the right temporal lobe did not produce a seizure. The corticogram focus in the right

temporal lobe was removed as well as the sensory cortical center for left upper extremity in the right post-central gyrus.

Postoperative course: Six months after operation the patient started to work six hours daily and was free from seizures. The aura of prickling and the numb sensation in her left hand have entirely disappeared. Within the past six months nocturnal seizures at menstruation time have been partially relieved by Mebroin.

Comment

It has been estimated that seizures in two-thirds of the 750,000 epileptic patients in the United States can be controlled by medical measures. It is the remaining third who require intensive study and well-planned therapy. Myers³ is of the opinion that approximately one-half of this remaining third can be materially benefited by surgery.

In our series of 43 patients treated surgically, all were examined according to the procedures above outlined. Surgical treatment was decided upon if the patient was refractory to medical therapy and was thought to have an epileptogenic lesion amenable to surgery.

Of the 43 patients, 21 were male and 22 female. The pathological findings are as follows:

| | |
|---------------------------------|----|
| Cortical atrophy | 25 |
| Meningo-cerebral cicatrix | 6 |
| Microgyria | 5 |
| Encephalopathy | 3 |
| Venous angiomas | 2 |
| Grossly normal cortex | 2 |

In the follow-up of our 43 patients after a four-to five-year period, five have died (two due directly to anesthesia). Of the remaining 38 patients, eight have not cooperated in follow-up. Of the 30 patients, ten have had no seizures and no medication since operation, and three on medication have had no seizures. Eight patients on medication have had 50 per cent fewer seizures than before operation, four on medication are slightly improved, and five obtained no relief from the operation.

Recent experimental work has been done with depth electrodes in which tracings are made from various levels of white matter. Results so far obtained indicate that possibly the epileptogenic discharge may be related in part to underlying activity rather than limited to the cortex.

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Congenital Anomalies

Report of Case of Bilateral Ectopic Kidneys

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Ectopic kidney is a congenital malformation in which one or both of the kidneys is misplaced, having failed in the normal ascent to the lumbar space. Varying positions of these kidneys can be found. It is generally accepted that any kidney below the crest of the ileum is considered a pelvic dystopia while those above the crest of the ileum are considered iliac kidneys.

Unilateral displacement is found much more frequently than bilateral displacement. Between 250 and 300 cases have been reported in the literature. Bilateral dystopia, however, is quite rare. Autopsy records reveal that renal ectopia of all kinds is found once in 1,200 autopsies. Clinically it has been estimated to occur once in 10,000 cases. The occurrence of bilateral ectopia in this number of cases would make up only a small per cent.

Bryan, after a careful search of the literature in 1915, could find only 18 authentic cases. In 1924 Darner made a thorough search of the world literature, including Bryan's report, and felt that he could reduce bilateral renal ectopia to 14 authentic cases. To these he added two cases from Johns Hopkins Hospital, making a total of 16 cases. McCown⁵ in 1929 found eight more reported cases to which he added two, making a total of 26 cases of bilateral renal ectopia. Anderson et al. in 1949 reviewed the world literature of renal ectopia in connection with pregnancy and reported 98 cases. Only three of these were reports of bilateral renal ectopia.

Etiology

Two theories have been advanced for the cause of this condition. Bryan proposed that during fetal evo-

lution, as the kidney slowly ascends from the pelvis to the lumbar region, it receives its blood supply from successively higher points on the aorta. If, in this excursion, one of the arteries does not give up its nutritive right, the kidney is arrested. As the kidney develops the artery thickens and becomes permanent,

The incidence of bilateral ectopic kidneys is discussed, and a case is presented. Diagnosis was established through surgery with a preoperative diagnosis of ruptured appendix with abscess formation. The difficulty of arriving at a correct diagnosis without urological workup, including pyelographic studies, is described.

and the kidney is anchored in a position not originally intended for it by nature.

Hill, Pohlman, and Strater contend that the kidney can be arrested at any point in its process of ascent, wholly independent of its blood supply. They believe that no vascularization of the kidney takes place until it reaches its permanent location. In an anomalous arrest of the kidney, it therefore follows that the kidney vessels must originate from the nearest arterial trunk. This can be one of several trunks. They reason that the abnormality of blood vessels does not produce the abnormal position of the kidney but rather that the abnormal position of the kidney of necessity makes it seek its blood supply from the nearest source.

Vascular supply of ectopic kidneys is from the nearest source in the plane in which they lie. Those in the pelvis usually receive their blood supply from the

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common iliacs or the common and external iliacs. In the false pelvis usually the aorta and vena cava in their lower parts supply branches to these ectopic organs.

Pathology

Pelvic kidneys need not necessarily have an abnormal structure, but the abnormal condition predisposes the organ to pathological conditions. Often hydronephrosis and pyonephrosis are found. Cystic degeneration, crossed dystopia, and horseshoe kidneys are found on rare occasions.

Symptoms

The dominant complaint is pain. This varies considerably in character from deep seated ache to intermittent attacks of acute, sharp, stabbing pain. It is not ordinarily typical of renal or ureteral pain and is usually referred to the lower abdomen. Because of this, a common diagnostic error is to suspect the appendix as the seat of the trouble. In the female, pelvic organs come in for suspicion. Often right lower quadrant pain is associated with tenderness and temperature elevation, muscle splinting, nausea and vomiting. Along with these symptoms one may find an elevated white blood count with a poly shift to the left. Rectal or pelvic examination reveals a mass, making one suspicious of ruptured appendix with abscess formation. Infection in the kidney, chills and fever, nausea and vomiting, together with urinary disturbances, focus attention on the importance of a complete urologic work-up including pyelographic studies. These will reveal the proper pathology. However, as will be shown in the case report to follow, symptoms and physical findings can be similar to those of appendicitis. With a normal urinalysis, a diagnosis of appendicitis with abscess formation can be made, as was true in this case.

Case Report

This 23-year-old white married female was first seen with a complaint of right lower quadrant pain which had persisted for two weeks. This pain was constant in nature but never severe enough to keep her awake at night until three nights before this time, when she sleep poorly because of discomfort. She stated she had been nauseated with pain but had not vomited. Her appetite had been fairly good until three days previously, when it became poor. Bowel movements had been regular and no diarrhea was present. She complained of no urinary difficulties, e.g. dysuria, burning, or frequency. Menstrual periods had been regular at 28-day intervals with a moderate flow of five days and no dysmenorrhea. No history of

upper respiratory infection was given. The patient complained that any walking or moving about aggravated the pain.

Physical examination revealed a 23-year-old white female not appearing acutely ill. Temperature was 99.4, pulse 80, and respiration 22. Blood pressure was 122/70. The remainder of the physical examination was not unusual except for the abdominal findings. The abdomen was flat. There was tenderness to palpation in the right lower quadrant. Muscle guarding was present and definite rebound tenderness could be elicited. Liver, kidneys, and spleen were not palpable. A questionable mass was encountered in the left abdomen just below and to the left of the umbilicus. (The patient volunteered the information that this was present when she had had a baby two years before. The doctor at that time told her this was a "pocket" in the bowel).

Pelvic examination revealed a clean cervix. The uterus was palpable anteriorly, was not enlarged, and was freely movable. A tender mass was present on the right side, roughly estimated to be about 4 by 4 by 8 cm. It was not movable. Rectal examination was not unusual except for tenderness in the right rectal vault.

Laboratory findings included hemoglobin 77 per cent, color index 1.04, red blood count 3,670,000, white blood count 10,000. Differential blood count: eosin -1, stabs -4, segs -76, lymphs -15, monos -4. Urinalysis: yellow, clear, ph 5, Sp. Gr. 1.022, sugar, albumin, acetone negative. Microscopic: few epithelial cells and occasional white blood cells.

A tentative diagnosis of ruptured appendicitis with abscess formation was made, and the patient was prepared for surgery. Because of the somewhat questionable findings and diagnosis, a lower midline incision was made. A normal appearing appendix was found and removed. Just at the iliac crest of the pelvis on the left, the left kidney was found. It was not movable and was not unusual to examination. The right kidney lay low in the pelvis just to the right of the bladder and appeared smaller in size than the left. No evidence of hydronephrosis or obstruction to ureters was found. Both ureters were visualized and appeared congenitally shortened. The right tube and ovary were congenitally absent.

The patient's postoperative course was not complicated. On her seventh postoperative day an intravenous pyelogram was done. The roentgenologist's report follows:

"After injection of opaque material into the vein, both kidneys function. The right kidney is identified lying low in the pelvis, so low that the lower pole is about 1 cm. above the bladder as visualized. This kidney appears to be only about one-half the normal size. No evidence of hydronephrosis or other de-

formity of the kidney on the right is found. The left kidney lies low with the lower pole lying over the crest of the ileum. The uterus appears to be displaced to the left. No abnormality of the bladder is seen. Neither ureter is fully visualized although no evidence of kinking or hydroureter is seen."

The patient has been seen repeatedly in the office since her discharge from the hospital. She continues to complain periodically of soreness in the right lower quadrant. Repeated urine examinations have been negative.

Discussion

A thorough urological work-up with pyelographic studies would probably have obviated this surgery. However, with a normal urinalysis and no definite symptoms referable to the urological system, the studies were deemed unnecessary in the physical work-up of this patient. Of interest in the review of the literature is the wide span of ages in individuals with this abnormality before symptoms present themselves with sufficient intensity for a diagnosis to be obtained. These ages span from 2½ years to 72 years. Probably the largest number of diagnoses are obtained in the female during the child bearing age when the en-

larged uterus, through pressure on the dystopic kidney, produces symptoms.

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Thrombosis

Thrombosis of the Internal Carotid Artery in the Neck

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Spontaneous thrombosis of the internal carotid artery in the neck is a common member of the occlusive cerebrovascular disease family, having been recognized as a clinical entity for over a century. It is only since 1937, however, when Moniz et al.¹ described antemortem diagnosis by carotid arteriography, that its frequency and protean forms have been appreciated. The literature is now voluminous, with verified cases numbered in the hundreds. In addition to reviewing briefly some of this literature, this report deals with the authors' quite representative experience and adds to the literature a relatively unusual case of internal carotid artery thrombosis secondary to closed cervical trauma.

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I. Spontaneous Internal Carotid Artery Thrombosis

Incidence

The strikingly high incidence of internal carotid artery thrombosis is perhaps best shown by the experience of Fisher,² in which 28 of 432 consecutive routine autopsy examinations showed complete occlusion of one or both carotid arteries in the neck. Significant narrowing of the arterial lumen was demonstrated in an additional 13 cases. Fisher's 28 cases with total internal carotid occlusion contrast surprisingly with only 12 cases of thrombosis of major intracranial vessels in the same autopsy series, and would make the disease comparable to intracerebral hemorrhage in frequency.

This high incidence is supported by the findings of

Livingston et al.³ utilizing carotid arteriography in the investigation of 30 hemiplegic patients with histories and findings typical of cerebrovascular thrombosis. Eight arteriograms showed internal carotid occlusion in the neck or intracranial portion, 10 showed thrombosis of major cerebral vessels, and 12 were normal by present standards of interpretation.

In a thorough review of the literature in 1951, Johnson and Walker⁴ studied 107 proved cases of spontaneous internal carotid artery thrombosis and

Though the syndrome of "cerebral vascular accident" is a common one, it is not widely recognized that spontaneous thrombosis of the internal carotid artery in the neck is a frequent occurrence, and that this disorder may produce a variable clinical picture. One should suspect this lesion more often, and its presence can be verified by carotid arteriography. Though at present its treatment is unsatisfactory, it is possible that an awareness of this syndrome and its early recognition may allow more prompt and definitive therapy in the future.

Eleven cases are presented with a general discussion of this challenging problem.

found the disease to be more than four times as common in males as in females and noted a predilection for the 30- to 60-year age groups. They also found that 65 per cent of thromboses occurred on the left, a clear cut difference perhaps dependent on anatomic relationships.

Pathology

Many of the European reports, in the second half of the last century, deal with common carotid thrombosis at levels as low as the aortic arch. This probably reflected the increased incidence of syphilis in that period and led to the initial implication of that disease as the prime etiologic agent. This concept yielded to the more complete pathologic studies which followed. In 1914 Hunt⁵ stressed the importance of routine autopsy examination of the carotid arteries in relation to spontaneous internal carotid artery thrombosis, and Dow⁶ in 1925 showed that the bifurcation of the common carotid and the intracranial carotid siphon are the major sites of atheromatous change in the artery.

The two sites at which internal carotid thrombosis

occurs are the zone 1 to 3 centimeters above the common carotid bifurcation and the intracranial carotid siphon near the origin of the ophthalmic artery. In Hultquist's⁷ series two-thirds of the occlusions were in the area of the carotid sinus and one-third were intracranial; the latter figure is high in comparison with other reports. Fisher² found ulceration of atherosclerotic plaques to underly the thromboses in his series, and he is in agreement with Hultquist and other recent European reports. This mechanism is currently accepted as explaining the vast majority of present day thromboses. Of considerable interest is the high incidence of bilateral thromboses in autopsy series.

Cerebral damage following cervical carotid thrombosis is variable in severity and location, but it is most marked in the distribution of the middle cerebral artery. Some unilateral occlusions are asymptomatic, reflecting an adequate collateral circulation from the uninvolved side by way of the anterior and posterior communicating arteries in the circle of Willis. If the thrombosis does not primarily involve or ascend into the intracranial portion of the internal carotid, retrograde flow in the ophthalmic artery from the uninvolved ipsilateral external carotid may furnish important intracranial collateral circulation.

Clinical Features

Although spontaneous internal carotid artery thrombosis at no point in its evolution as a clinical entity has been characterized by a single syndrome, for many years monocular optic atrophy and blindness associated with contralateral hemiplegia were regarded as the classical clinical picture. Such a combination of features remains nearly pathognomonic of the condition, but it has become increasingly apparent that only a small minority of carotid occlusions present these findings in combination.

Moniz, the pioneer in cerebral angiography, was the first to recognize the more common features of the disease as he discovered it in unsuspected patients during routine carotid arteriography. Moniz's⁸ syndrome as he outlined it in his monograph in 1940 has been described in English by his associate, Lima,⁹ who speaks of a prodromal period of headaches and transitory paralyzes of the hand, followed by hemiplegia of sudden onset, involving the upper extremity maximally, which frequently shows rapid spontaneous improvement and is occasionally accompanied by papilledema.

Johnson and Walker divide the symptomatology into three patterns. Thirty-five per cent of their reviewed cases showed sudden onset of hemiplegia with severe headache or loss of consciousness. Twenty-five per cent showed a gradual onset with severe headache, progressive hemiparesis with paresthesias, and seizures

in some cases. Forty per cent were characterized by transitory attacks of hemiparesis, paresthesias, and headache. Both of the latter two types frequently terminated in full blown hemiplegia, with of course aphasia if the left carotid was involved.

Decreased carotid pulsation above the hyoid bone was associated early with some cases of thrombosis, according to Hunt, but by no means is a constant feature. Fisher stresses dementia as common, particularly in the presence of bilateral occlusions, and Lima also feels personality change to be a characteristic. Visual disturbance or loss on the side of the thrombosis is frequent, correlating with changes in ophthalmic artery blood flow.

Arteriographic Aspects

Carotid arteriography is the prerequisite for antemortem diagnosis in the absence of cervical carotid exploration. Puncture of the cervical common carotid artery is followed by the rapid injection of an appropriate contrast medium, during which a lateral roentgenogram of the skull and neck characteristically shows good filling of the common and external carotid arteries and the first centimeter or less of the internal carotid, clearly establishing the point of obstruction. In cases in which the carotid thrombosis is intracranial, the cervical portion of the artery is filled. The cerebral vessels show no direct filling during the arterial injection.

Arteriography also has proved the collateral circulation of the involved cerebral hemisphere. Contralateral carotid arteriograms frequently showed filling of the anterior and middle cerebral arteries on the side of the thrombosis by way of the anterior communicating artery. (Such contralateral arteriograms are no longer done, since early experience showed a high mortality.) In addition, the arteriogram or a delayed exposure three seconds after carotid injection of the contrast medium occasionally shows filling of the ipsilateral cerebral vessels by way of the external carotid and ophthalmic arteries.

Treatment

In recent years many forms of treatment have been employed, and their multiplicity attests their ineffectiveness. Stellate ganglion blockade, anticoagulants, cervical sympathectomy, excision of thrombosed carotid segment, thrombectomy, and even carotid-jugular anastomosis have been tried, with at best equivocal results. The inability of central nervous system tissue to tolerate anoxia for more than a few minutes probably will always vitiate any attempts at surgical therapy once cerebral ischemia has shown itself by full-blown hemiplegia.

In the acute phase the administration of oxygen, strict bed rest without elevation of the head, and any

measures necessary to insure an optimal cardiovascular status are widely accepted. The importance of such a program lies in its support of an effective collateral circulation, and correction of any anemia or hypotension in most important.

Physiotherapy for the involved extremities is a valuable contribution to convalescence, and the prognosis for limited gradual improvement is fair.

Prophylactic reconstruction of a stenotic internal carotid artery, which was responsible for intermittent attacks of visual loss and hemiparesis, has been reported by Eastcott et al.¹⁰ with complete relief of symptoms. It constitutes a logical approach to the problem where atherosclerotic stenosis of the carotid at the bifurcation can be demonstrated in a prodromal period before irreversible neurologic changes have occurred.

Present Series

Ten arteriographically proved cases of spontaneous internal carotid artery thrombosis in the neck are presented here. The very fact that they were usually referred for neurosurgical evaluation undoubtedly has introduced an element of selectivity in that many patients presenting completely typical "cerebral thromboses" were not seen. Nevertheless the series is in almost all respects comparable to the experience of other observers.

All of the cases were in males with an average age of 51 years and representing a range of 38 to 65. Three patients were hypertensive, but the others showed no evidence of cardiovascular disease. In all cases negative skull films were obtained prior to diagnosis by percutaneous carotid arteriography.

Varied clinical pictures were observed in the series. Only two patients (Nos. 3 and 8) showed the classic picture of optic atrophy and contralateral hemiplegia. Clinically they would be included in Group One of Johnson and Walker with three others (Nos. 1, 2, 5) who also experienced sudden severe onset of symptoms. Four patients (Nos. 4, 6, 7, 9) presented Moniz' syndrome and fall into Group Three of Johnson and Walker with headaches and recurrent attacks of neurologic symptoms preceding the onset of hemiplegia. One patient (No. 10) fits into Group Two, with seizures and an apparently progressive hemiparesis.

Ophthalmologic changes included papilledema in one patient, optic atrophy in two, retinal arteriolar constriction in three, and homonymous hemianopsia accompanying hemiplegia in two. Three patients, two with Moniz' syndrome, had clonic cortical motor seizures; the distinction of attacks of paresthesia from cortical sensory seizures was not attempted.

Decreased carotid arterial pulsations in the neck were noted in three patients and not recorded in

seven. Most of the latter, however, presented good pulsation at the time of arterial puncture and may be assumed normal.

Lumbar puncture was carried out in four instances and showed no abnormalities of spinal fluid pressure or constituents. Electroencephalograms were obtained in six cases and reported as normal in four, the others showing slow activity in the anterior temporal area in one and anterior hemisphere dysfunction in the other. Lateralization was correct in both instances.

Focal cerebral signs were present in seven of the ten cases, though in two they were specific only to the distribution of the appropriate middle cerebral artery. In five cases, however, localization of neurologic deficit was precise and in each instance implicated the parasagittal pre- and postcentral gyri of the involved hemisphere.

The specificity of localizing signs was responsible in several patients for difficulty in clinically excluding a frontoparietal glioma, and this partially accounted for a low incidence of correct prearteriographic diagnosis. In five of the ten cases, tumor was strongly suspected on admission, and in two of them it was considered probable. The correct diagnosis was made initially in only three patients, two of whom showed the classic clinical picture.

Arteriographically our findings were also typical. In all cases the obstruction was in the area of the carotid sinus, with no dye visualized beyond the first centimeter of the internal carotid in eight. In Case No. 5 the obstruction was 2 centimeters distal to the bifurcation, and in Case No. 9, a patient who showed the classic picture of carotid thrombosis, there was evidence that an obstruction at the bifurcation was incomplete, a trace of dye in the internal carotid being visualized distally.

Six patients showed collateral circulation to the ipsilateral middle cerebral artery by way of the external carotid and ophthalmic arteries, and four of these showed middle cerebral filling in the venogram as well.

Only one of the patients underwent operative intervention, a cervical carotid thrombectomy three weeks after the onset of hemiplegia which was not unexpectedly unavailing.

CASE REPORTS

1. D. E., KUH 53-4852. This 44-year-old man was well until the day of his admission when he suddenly became unconscious for 15 minutes and on recovery was found to be paralyzed on his right side and aphasic. A history of frequent epistaxis was obtained, and his blood pressure on admission was 160/100. Neurologically he presented a complete flaccid right hemiplegia accompanied by sensory loss, and a right

homonymous hemianopsia. Severe aphasia was present.

Eight days after admission left carotid arteriography showed internal carotid thrombosis in the neck, and 22 days after the onset of symptoms internal carotid thrombectomy was carried out without obvious benefit.

During his hospitalization he received physiotherapy and showed gradual improvement in his hemiplegia.

2. W. L., KUH 54-9442. This 46-year-old man was well until five months before admission when he experienced the onset of frequent frontal headaches. Two months before admission he became unable to see clearly to the left. Four days prior to his transfer to this hospital he suddenly developed a left hemiparesis followed by increasing drowsiness and disorientation. Admission examination disclosed bilateral papilledema, a severe spastic left hemiparesis, complete in the upper extremity and accompanied by sensory loss and left homonymous hemianopsia, and drowsy disorientation with incontinence.

Because of the admitting diagnosis of "right frontal glioma with hemorrhage," emergency right carotid arteriography was carried out on the day of admission and showed internal carotid obstruction in the neck. A pneumoencephalogram one week following admission revealed slight ventricular shift to the left, compatible with cerebral edema on the right. The treatment was supportive only, and he showed gradual improvement during his hospitalization.



Figure 1. Normal cerebral arteriogram showing internal carotid artery and its intracranial distribution.

3. C. M., KUH 54-7071. This 55-year-old man was well until 19 months before admission when he noted gradual blurring of vision in the right eye. Four months later he was hospitalized elsewhere for coma of sudden onset lasting four days, from which he recovered with a residual left hemiparesis. He was admitted to this hospital for the exclusion of parasellar tumor, and on admission he displayed outstanding loss of mental facility, a moderate spastic left hemiparesis, and bilateral optic atrophy with visual acuity loss, more marked on the right. It was felt that he represented bilateral internal carotid artery thrombosis, with a relatively silent right-sided lesion 19 months before rendered symptomatic by a subsequent left-sided occlusion with loss of collateral circulation.

One day after admission the cervical obstruction was proved by right carotid arteriography, with surprisingly good right middle cerebral artery filling displayed by way of the ophthalmic artery. A left carotid arteriogram was not done because of possible internal carotid patency, and he was discharged to continue his stable course.

4. H. W., KUH 55-1794. This 38-year-old man was well until two months before admission when he experienced a two-minute attack of progressive left

upper extremity numbness and tingling which cleared in 30 seconds. Twenty similar attacks followed in a three-week period. One month prior to admission he developed constant left upper extremity numbness for a four-day period, and he awoke on the fifth day aphasic with a left hemiparesis. The aphasia cleared in four days. On admission, neurological examination showed a moderate spastic left upper extremity paresis, slight spastic left lower extremity paresis, impaired position sense in the left foot, and impaired arithmetic and spelling, with inability to form the letter "r."

The right internal carotid thrombosis was revealed by arteriography on the third hospital day after negative lumbar puncture and electroencephalography. Good middle cerebral artery filling by the ophthalmic artery was present. He remained clinically unchanged during our observation.

5. P. K., KUH 55-9215. This 65-year-old man was well, except for mild personality change and memory loss, during a five-year period. Three months before admission he experienced the sudden onset, while working, of left upper extremity paralysis and left lower extremity weakness. There was no progression of deficit, and on admission he showed a minimal spastic left hemiparesis except for the left upper extremity, which was paralyzed. There was slight impairment of position sense on the left and fundoscopic examination showed retinal arteriosclerosis. Right carotid arteriography on the second hospital day showed internal carotid obstruction 2 centimeters above the carotid bifurcation.

6. E. G., KUH 55-9546. This 52-year-old man was well until two months before admission when he developed transient episodes of light-headedness and blurred vision. One month before admission such an episode persisted, accompanied by nausea, and followed by progressing awkwardness in his left upper extremity. Admission examination disclosed a mild spastic left hemiparesis, decreased right carotid pulsation in the neck, and "attenuation of retinal arterioles." An electroencephalogram showed "right anterior hemisphere dysfunction," and on the fourth hospital day carotid arteriography proved cervical internal carotid thrombosis, with some collateral circulation through the ophthalmic artery to the middle cerebral artery. His neurologic deficit was stable under our observation.

7. E. T., KUH 55-9721. This 57-year-old man noted the onset seven months before admission of numbness lasting several seconds in the right upper extremity. He developed frequent episodes, up to three minutes in length, of clonic motor seizures in the right foot, spreading to involve the leg and arm and accompanied by numbness in the involved ex-



Figure 2. Cerebral arteriogram in Case 11, showing features of internal carotid artery thrombosis in the neck. Note the position of the needle in the common carotid artery, the short segment of patent internal carotid at the bifurcation, and the intact external carotid artery.

tremities and inability to speak. Three weeks prior to admission these focal seizures increased in frequency. Neurological examination disclosed a mild right brachial monoparesis with right-sided hyperreflexia and sustained right ankle clonus. His blood pressure was 180/100, his roentgenographic cardiac contour hypertensive, and his electrocardiogram suggestive of myocardial ischemia. Lumbar puncture and electroencephalogram were normal, and six days after admission carotid arteriography showed his internal carotid occlusion, with fair filling of the middle cerebral by the ophthalmic artery evident in the delayed film. Treatment was limited to anticonvulsant medication.

8. C. H., KUH 55-10437. This 43-year-old man awoke two months before admission with throbbing occipital headache and visual loss in the right eye which was complete except in the peripheral temporal field. Two weeks prior to admission he noted weakness of his left extremities and sensory change in the left hand. Examination showed a mild spastic left hemiparesis, decreased right cervical carotid pulsation, and an old occlusion of the central retinal artery in the right eye. Shortly after admission right carotid arteriography showed virtually complete occlusion of the proximal internal carotid artery.

9. J. S., KUH 55-10445. This 51-year-old man, hypertensive for 20 years, noted sudden weakness of his right lower extremity lasting one minute while at work three months before admission. He subsequently developed increasingly frequent attacks of trembling of the right forearm. The attacks apparently were convulsive in nature, lasted several seconds, and occurred daily at the time of admission. Examination showed a spastic right hemiparesis, marked in the lower extremity, and hypertensive fundusoscopic changes. Carotid arteriography on the third hospital day showed internal carotid occlusion, with some middle cerebral arterial filling by the ophthalmic collateral.

10. J. W., KUH 54-14103. This 61-year-old man was well until 11 months prior to his first admission when he experienced a two-minute episode of quivering in his left lower extremity, followed 15 minutes later by a similar episode. Numbness of the left foot and calf were present after this and progressed in subsequent months, during which he had several further focal cortical motor seizures and attacks of numbness in the left hand. Examination revealed a mild spastic left hemiparesis, maximal in the lower extremity, and decreased position sense in the toes. Ophthalmologic consultation revealed an "old macular lesion" in the right eye with a central scotoma. Lumbar puncture and electroencephalogram were not remarkable, and he was discharged under a cerebrovascular disease diagnosis. One month later he was re-

admitted for prostatic surgery and seen in consultation because of equivocal progression of his neurologic deficit. Arteriography to exclude a parasagittal meningioma revealed internal carotid occlusion in the neck with excellent intracranial collateral supply by the ophthalmic artery.

II. Internal Carotid Artery Thrombosis in the Neck following Non-penetrating Cervical Trauma

Traumatic cervical internal carotid artery thrombosis in the absence of lacerating arterial injury or surgical ligation is an unusual condition. Sedzimir¹¹ has reviewed internal carotid thrombosis secondary to head injury and reported further cases in which the intracranial portion of the artery has become thrombosed, usually in association with basilar skull fracture. Caldwell¹² presents two cases of penetrating neck injury resulting in internal carotid artery thrombosis in which contusion of the vessel was clearly shown to precede the thrombosis. Schneider and Lemen¹³ have reviewed five cases in which non-penetrating neck injuries preceded the thrombosis, and they reported two cases under their care. Their excellent discussion of the subject stresses that cervical carotid thrombosis must be included in the differential diagnosis of craniocerebral trauma and may simulate expanding intracranial hematoma. The phenomenon of intra-arterial thrombosis following intimal contusion by surgical manipulation of the vessel is familiar to all who work with vascular surgery.

We have observed recently a patient in whom a

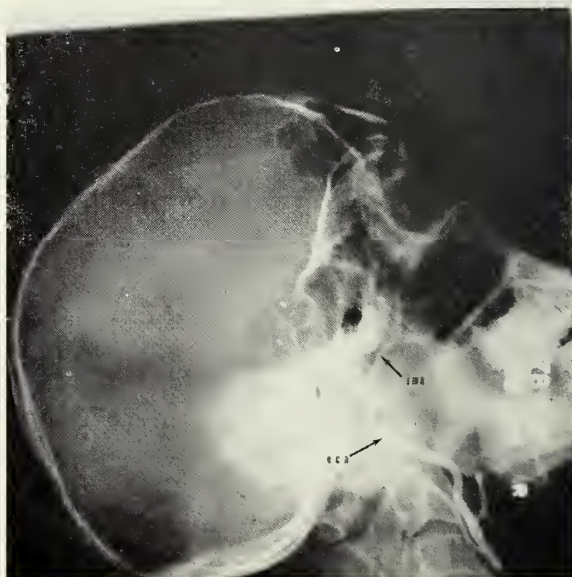


Figure 3. Cerebral arteriogram in Case 10, showing filling of the external carotid and internal maxillary arteries.

well documented non-penetrating cervical injury clearly led to a symptomatic internal carotid occlusion which was arteriographically proved. The case is presented because the rarity of the problem in medical literature undoubtedly does not reflect its clinical incidence. An awareness of its existence may result in better prophylaxis and therapy than were given in this example.

CASE REPORT

K. N., KUH 54-9414. This 28-year-old man was well until five hours prior to his admission, when he sustained a 20-second compression of his right anterior cervical area when his head became caught in farm machinery. Following his release from the machine he was unconscious for 30 seconds. On regaining consciousness he displayed personality change and a left hemiplegia. These signs cleared over a two-hour period. On admission he displayed no neurological abnormalities except for slight drowsiness. A small right mandibular abrasion was present. It was felt on admission that he represented a recovering right carotid compression.

Three hours after admission, during a half-hour gap in observation, he developed mild confusion, left upper extremity paralysis, and left lower extremity weakness. One hour later, despite administration of CO₂ and O₂, he displayed a complete left hemiplegia. Stellate ganglion blocks were not effective.

Twenty-two hours after admission the right internal carotid artery was explored in the neck and appeared patent to inspection. Aspiration was not carried out.



Figure 4. Same carotid injection as in Case 10, taken three seconds after Figure 3. Note the middle cerebral artery filling by way of the ophthalmic artery and the intracranial carotid artery. No venous filling is seen.

His hemiplegia persisted unchanged, and nine days after admission right carotid arteriography showed thrombosis of the internal carotid at its origin. His mental state improved during hospitalization, and he was discharged on a physiotherapy program.

The lessons here are multiple. Due recognition was not given the severity of initial right cerebral anoxia which had caused hemiplegia at the time of injury, and on admission recumbency and oxygen were clearly indicated. A gap in clinical observation permitted a moderately advanced hemiplegia to develop before support for collateral circulation was given. Internal carotid exploration was delayed 19 hours, at which time irreversible cerebral changes undoubtedly were present, and the opportunity for thrombectomy at the time of exploration was missed by failure to aspirate the suspected artery.

Cervical injuries which have involved the carotid arteries clinically or anatomically should be regarded as candidates for carotid thrombosis. Prophylactic support of cerebral oxygenation is indicated, observation to detect early signs of thrombosis is essential, and thrombectomy must be immediate if neurologic signs appear.

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Tuberculosis

Report of Survey of Current Control Measures in Kansas

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The steady decline of the tuberculosis rate in Kansas has been generally interpreted as evidence of the successful control of this disease. At the suggestion of the Kansas Tuberculosis and Health Association, the various agencies interested in the control of tuberculosis have wisely paused to consider our local tuberculosis problem critically in order to plan the most effective approach to it. The survey conducted by Dr. Joseph Stocklen of Cleveland, Ohio, and his group of survey experts, and reported in part at the recent meeting of the Tuberculosis and Health Association, gives an excellent review of our tuberculosis problem and the facilities that are currently available in the state for the solution of this problem.

A review of the statistical data on tuberculosis presents a picture of successful tuberculosis control in comparison to other areas of the United States. In comparing tuberculosis rates in Kansas with those of the nation as a whole, Kansas fares quite well with an incidence of 24.1 per 100,000 compared to 71.9 for the United States, and a mortality of 7.7 per 100,000 compared to 16.2 for the United States. However, the incidence in Cherokee County is 119 per 100,000 with a mortality rate of 57 per 100,000.

In reviewing the facilities available in Kansas for tuberculosis control and for the care of tuberculosis patients, it soon becomes evident that there is much room for improvement. The following critical review of these facilities is presented with the hope that knowledge of the deficiencies in our control program will serve as a prelude to improvement in the current management of tuberculosis in Kansas and the building of an organization to meet the uncertain problems of the future.

Organization of Tuberculosis Control Program

Statistical accounts of any disease entity are valuable only if adequate and accurate data about the disease are collected. Thirty per cent of the recorded deaths from tuberculosis in Kansas were in patients who had not previously been reported to the Kansas State Board of Health as having the disease. These individuals were either undiagnosed prior to death

or, more likely, were diagnosed but not reported. This suggests that many patients with tuberculosis remain unreported to the legally designated collecting agency. One hundred sixty-four cases were known to the Board of Health but not counted officially, primarily because of lack of information. There were 70 non-hospitalized patients not officially recorded, and of these one-third had acid fast bacilli cultured from sputum or gastric contents within six months of the study date.

Many of the public health records are of little value because standard nomenclature was not used or insufficient information was made available for recording of cases. The communication of pertinent information from the private physician and tuber-

A critical review of the Kansas tuberculosis survey, with recommendations, is presented. The implementation of the recommended program rests in the hands of the citizens and physicians of Kansas.

culosis hospital to the Board of Health and from the Board of Health to local health agencies and private physicians was found to be poor, resulting in a lack of knowledge about many tuberculosis patients and disorganized patient and contact follow-up.

Dr. Stocklen summarizes his observations on tuberculosis control in Kansas as follows: "As the observer reviews the statistical record he recognizes that a public health problem confronts Kansas. As the organization of the program designed to meet this problem is surveyed, one is amazed at the headless organization designed to control tuberculosis. In reality, there is little organization or little design in view of the fact that the control of this disease requires the combined, coordinated efforts of health workers and the public in an all-out attack with common standards and a common goal."

The epidemiological approach to tuberculosis problems has been proved of great value, and a well-organized system of collecting and disseminating information is imperative to our tuberculosis control program.

Presented at a meeting of the Kansas Trudeau Society, Wichita, September 27, 1956.

Dr. Stocklen recommends that a physician well versed in the clinical and public health aspects of tuberculosis be appointed as tuberculosis control officer and that adequate financial assistance and cooperation be given so that pertinent information may be collected by a central agency. This agency should be part of the Kansas State Board of Health and should also have the responsibility of coordinating control, treatment, and rehabilitation of the tuberculosis patient, thereby presenting a consistent effective approach to the medical and socio-economic aspects of this disease.

Hospital Facilities

The responsibility for the hospital care of patients with tuberculosis rests predominantly with the Institutional Division of the Kansas State Board of Social Welfare, the University of Kansas Medical Center, and the Veterans Administration hospitals in this area. The University of Kansas Medical Center and the VA hospitals have adequate facilities, personnel, and programs for modern tuberculosis treatment.

Under the direction of the Kansas State Board of Social Welfare are the State Sanatorium for Tuberculosis at Norton with its Hillcrest Division, the Southeast Kansas Tuberculosis Hospital (which will soon open in Chanute), and the state mental hospitals at Larned, Topeka, and Osawatomie. The physical facilities at Norton and Hillcrest make adequate isolation of patients extremely difficult, if not impossible. Inadequate work space and shortage of toilet and bathing facilities make patient care difficult. The severe shortage of qualified personnel makes it necessary to utilize as employees some patients with positive sputum. In spite of these handicaps, this institution has carried the burden of tuberculosis treatment with gratifying results through the years.

Because of the poor facilities at Hillcrest, its somewhat inconvenient location outside of Topeka, and a rather expensive annual operating budget of \$75,000 for the care of 14 in-patients and the operation of an out-patient department, Dr. Stocklen recommends that the division be discontinued in favor of a chest clinic located more conveniently in Topeka.

The lack of trained personnel, adequate isolation facilities, laboratory and diagnostic facilities, and medical staff at the psychiatric hospitals makes adequate care of this combination of diseases difficult. The concentration of tuberculous mental patients at one of the psychiatric institutions would justify the development of adequate laboratory facilities, a well-trained staff, and the building of a unit with adequate isolation, diagnostic, and treatment facilities.

The efficacy of this type of program has been well demonstrated at the Veterans Administration Hospital at Salt Lake City where a medically-oriented psychiatric staff and a psychiatrically-oriented medical staff with the necessary diagnostic facilities have formed a team that offers excellent management and the greatest hope for rehabilitation of the patient with tuberculosis and psychiatric disease. The institution at Osawatomie or Topeka would be best suited for such a tuberculosis psychiatric unit, but final location must of necessity be determined by the supply of trained physicians available.

Care of Non-Hospitalized Tuberculosis Patients

Although there are limited chest clinic facilities in the three large metropolitan areas of Wichita, Topeka, and Kansas City, and in Cherokee County, only six-tenths per cent of the non-hospitalized tuberculosis patients are followed by these clinics. The majority are cared for by private physicians, and this includes many medically indigent patients.

Since 47.7 per cent of the patients with significant tuberculosis in Kansas and 81.6 per cent of the patients in Cherokee County are unhospitalized, the importance of the problem of out-patient treatment is apparent. The successful treatment of tuberculosis requires a careful evaluation of the chest x-ray changes and bacteriological studies at regular intervals, usually every month during the active phase of the disease. However, over 50 per cent of the non-hospitalized patients in this state were of unknown bacteriological status, and 20 per cent had had positive sputum within the six months prior to the date of this report.

The treatment schedule on the non-hospitalized patients is as follows: Some form of drug and rest treatment in 21.5 per cent, drug treatment only in 21.5 per cent, rest only in 3.9 per cent, no treatment or no information available in 53 per cent. Many of the non-hospitalized patients were on streptomycin only, a drug regime proved several years ago to produce streptomycin-resistance and treatment failure.

The fact that treatment failure results from our inadequate management of tuberculosis is demonstrated at the State Sanatorium at Norton. Twenty per cent of its population has been hospitalized for two years or more. The national average of patients hospitalized for two years or more is 10 per cent. About two-thirds of the prolonged hospitalizations at Norton represent treatment failures. These are not necessarily treatment failures at Norton but are more likely the result of inadequate initial treatment by private physicians or at other hospitals. Dr. Stocklen has recommended that medically approved district

tuberculosis clinics be developed for case finding and treatment.

The tuberculosis problem in Cherokee County is primarily a result of silicosis in the tri-state area. Since silicosis is not a reportable disease, its prevalence and the occurrence of new cases cannot be

evaluated. It was recommended by the survey team that silicosis be made a reportable disease and that a survey be conducted to determine its prevalence and whether any new cases are developing.

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Hepatic Coma

Use of a New Drug, Arginine, in Its Treatment

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Therapy of patients in hepatic coma is fraught with many difficulties and has been singularly unrewarding in the majority of cases. Mono-sodium glutamate, protein restriction, antibiotics, and other measures have been used with varying success as means of combating the metabolic disturbance to which these patients so frequently succumb.

Excess accumulation of ammonia in the blood is one of the factors in this disturbance which can be detected and against which therapy can be directed. Recent studies by Greenstein, Winitz, Gullino, Birnbaum, Otey, and du Ruisseau¹⁻⁵ have indicated that *l*-arginine can protect rats from LD_{99.99} doses of ammonium acetate. Stimulated by these reports and by the suggestions of Dr. Santiago Grisolia, of the McIlvain Laboratories, we have utilized intravenous infusions of *l*-arginine HCl in the treatment of hepatic coma in three patients with excellent results.

Case 1. F. C., KUMC 54-6657, male, age 62. This report is based on his fourth KUMC admission. His first admission was from June 24, 1954, to July 5, 1954, at which time he underwent a left hemimandibulectomy for squamous cell carcinoma of the gingiva. His second admission, from June 27, 1956, to July 5, 1956, was occasioned by rapid, recent accumulation of ascites. History was obtained then of excess alcohol consumption for more than 30 years. The patient left the hospital against advice after one paracentesis of 2,000 cc. was done. He was followed in the out-patient Hepatic Clinic until admission for the third time, September 12, 1956, to October 24, 1956, again because of massive ascites. Blood ammonia levels during this admission ranged from 103 to 139 mcg. per cent. During one 48-hour period he manifested some signs of impending hepatic coma which cleared after rigid protein restriction. He again left the hospital against advice and returned from October 29, 1956 to November 5, 1956. He had been taking Gelusil and Meticorten in the interim.

Physical examination on admission revealed a malnourished, chronically ill man with massive ascites and peripheral edema. Liver palms, white nails, and numerous spider nevi were noted. The liver could be palpated 6 cm. below the right costal margin and was blunt, firm, nodular, and non-tender. The spleen was not palpably enlarged. He was placed on a 500-

Three patients in hepatic coma have been treated with intravenous *l*-arginine HCl with recovery in all three. Use of arginine is recommended in the management of hepatic coma.

mg. sodium, low protein, high carbohydrate diet and was continued on Meticorten and antacids.

On November 1, 1956, he became irrational and completely disoriented, with a flapping tremor and fetor hepaticus. Blood ammonia was 133 mcg. per cent. He became progressively lethargic and eventually semi-comatose. Six grams of *l*-arginine HCl* was given intravenously and, in the succeeding 18 hours, he cleared mentally and was again oriented and rational, and the signs and symptoms of hepatic coma disappeared. Blood ammonia on November 3, 1956, was 113 mcg. per cent. He stated he felt better than at any time in the preceding six months. Unfortunately, he left the hospital again against medical advice. Total dose of arginine was six grams.

Case 2. W. M., KUMC 49-1474, a Negro male, age 47, was being treated on his sixth KUMC admission. His first three admissions were in 1949, 1952, and 1953 for treatment of Laennec's cirrhosis with ascitic decompensation. In 1953 esophageal varices were first discovered by x-ray. His fourth ad-

* Trainee, National Institute of Arthritis and Metabolic Diseases.

* Obtained from California Foundation for Biochemical Research, Los Angeles, California.

mission in 1954 was because of the appearance of a large node at the angle of the left mandible. The patient refused surgery at that time and was re-admitted in January of 1956 for the fifth time, when an excision biopsy of the mass showed it to be metastatic anaplastic carcinoma. The primary site has not been determined.

He was admitted for the sixth time on November 17, 1956, with the complaint of increasing abdominal and ankle swelling, and of a cough of two weeks' duration. He noted black bowel movements for a few days prior to admission and moderate anorexia. He admitted considerable alcoholic intake over many years.

Physical examination revealed induration of the area of the neck biopsy but no clinical recurrence. Spider nevi were present, as was mild clubbing of the fingers. Tense ascites and 4+ peripheral edema was readily apparent, and a rectal stool specimen was black and hematest positive. An upper extremity tremor was present but was not flapping in nature. He was treated with antacids with cessation of the gastrointestinal bleeding, and ascitic removal was accomplished slowly by means of an intra-abdominal catheter. The ascitic fluid revealed Class V cells on cytologic study.

On December 4, 1956, it was noted that the patient was confused and totally disoriented. A marked flapping tremor was present for the first time. Blood ammonia was 203 mcg. per cent. He became progressively stuporous and by the following morning was completely comatose, and fetor hepaticus was noted. Ten grams of *L*-arginine was begun and completed in two hours. Two succeeding 10-gram treatments were given at approximately eight-hour intervals. Four hours after the first infusion he began to respond and became considerably agitated. In the succeeding 12 hours he cleared mentally, the agitation disappeared, and the following morning he responded in a rational manner to questioning. During the evening of December 5, 1956, the flapping tremor reappeared but was gone by the following morning. Blood ammonia on December 6, 1956, was 192 mcg. per cent. The patient remained mentally clear and, on December 9, 1956, demanded to leave the hospital and was released against advice. Total dose of arginine was 30 grams.

Case 3. S. L. R., KUMC 56-14916, a white female, age 50, is now reported on her second KUMC admission. Her first admission was from November 6, 1956 to December 2, 1956. History revealed that the patient had suffered an apparent attack of hepatitis in 1945. She had remained fairly well since then, except for a surgical exploration in 1951 because of a benign intestinal obstruction. In the year prior to admission she had noted gradual enlargement of the

abdomen and loss of appetite and had been treated by her local physician with ACTH, steroids, and diuretics. Two weeks prior to admission the abdominal swelling began to interfere with her breathing and, at the time of admission, she was acutely dyspneic and orthopneic. Immediate paracentesis was done, with relief of much of the dyspnea. Other significant physical findings were a loud bruit over the epigastrium and peripheral edema. No jaundice was present. Liver function studies revealed moderate parenchymal dysfunction. A liver biopsy was unsuccessful. Blood ammonia values ranged from 137 to 193 mcg. per cent. Hepatic vein catheterization revealed an elevated hepatic wedge pressure with no evidence of hepatic necrosis.

She was treated with sodium restriction, low protein, high carbohydrate diet, antacids, and Cortisone. She was discharged to be followed by her local physician.

She was seen by her physician on the evening of December 16, 1956, and was noted to be confused and to have a mild tremor. In the preceding few days she had received Diamox, in an attempt to reduce the peripheral edema. On December 17, 1956, she was found in a semi-comatose condition and brought to this hospital. Examination revealed the findings reported before, and additionally that she was in an agitated semi-comatose state. There was moderate ascitic accumulation, marked peripheral edema, and hyperactive reflexes. No pathologic reflexes could be elicited, and there was no tremor. Fetor hepaticus was questionably present. Blood ammonia was 338 mcg. per cent.

An enema was given with good results; no blood was evident. Magnesium citrate (two ounces) was given and Neomycin was started—one gram every six hours. Ten grams of *L*-arginine HCl was given intravenously over a two-hour period shortly after admission, and the dose was repeated one time four hours after admission. Within four or five hours after the first infusion was begun she became quiet and began to respond more appropriately to questioning, although she was still disoriented. During the succeeding 12 hours she became alert and by the following morning, was able to sit up in bed, converse intelligently, and eat breakfast. She had no recall of the preceding 24 hours. Blood ammonia was 228 mcg. per cent on December 18, 1956, and 167 mcg. per cent on December 19, 1956. At the time of this report the patient is still in the hospital and has remained without evidence of recurrence of coma.

Discussion

The clinical recovery of these patients was much more rapid than hitherto obtained with other methods of therapy. None of these patients received

mono-sodium glutamate at any time, although other means of supportive therapy were given.

Arginine probably exerts its beneficial and protective effect by increasing the turnover rate of the classic Krebs-Henseleit urea cycle within the liver. Recent monographs^{6, 7} have reviewed the reactions in this cycle extensively, and they will not be discussed here. Further studies on arginine metabolism in hepatic coma in these and other patients are in progress and will be reported at a future date.

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A people may prefer a free government, but if from indolence, or carelessness, or cowardice, or want of public spirit, they are unequal to the exertions necessary for preserving it; if they will not fight for it when it is directly attacked; . . . if by momentary discouragement, or temporary panic, or a fit of enthusiasm for an individual, they can be induced to lay their liberties at the feet even of a great man, or trust him with powers which enable him to subvert their institutions—in all these cases they are more or less unfit for liberty; and even though it may be for their good to have had it even for a short time, they are unlikely long to enjoy it.

—John Stuart Mill



It is again time for those annual New Year's resolutions. Do you have yours made out? Perhaps the following quotations may offer some useful suggestions to you.

"There are two good rules which ought to be written upon every heart. Never believe anything bad about anybody, unless you positively know that it is true. Never tell even that, unless you feel that it is absolutely necessary, and that God is listening while you tell it."

Henry van Dyke

"If it is not right, do not do it: if it is not true, do not say it."

Marcus Aurelius

"However mean your life is, meet it and live it; do not shun it and call it hard names. It is not as bad as you are. It looks poorest when you are richest. The fault-finder will find faults even in paradise. Love your life."

Henry David Thoreau

"Trust men and they will be true to you; treat them greatly and they will show themselves great, though they make an exception in your favor to all their rules of trade."

Ralph Waldo Emerson

"They that be diligent about their work live without check or rebuke."

Sir Thomas More

"They stumble that run fast."

William Shakespeare

"A man must have the gift to discern at all turns where the true heart of the matter lies and to plant himself courageously on that, as a strong true man that other men may rally round him there. He will not continue leader of men otherwise."

Thomas Carlyle

"What part soever you have taken upon you, play that as well as you can and make the best of it."

Sir Thomas More

"The way to speak and write what shall not go out of fashion is to speak and write sincerely. The argument which has not power to reach my own practice, I may well doubt will fail to reach yours."

Ralph Waldo Emerson

"A virtue which I need in a higher degree, to give beauty and lustre to my behavior, is gentleness. If I had more of an air of gentleness I should be much mended."

Jonathan Edwards

"Happiness and success depend strangely upon our ability to free our minds to work for us. Anything that inhibits the flow of spiritual energy through the mind tends to defeat us. A careful and consistent cultivation of a relaxed attitude is important. You do not need to be defeated by anything. Your life can be a great experience. Get the calm, selective ability to take up one thing at a time and concentrate upon it. Deal finally with it, if possible, before passing on to the next matter."

Norman Vincent Peale

"The peacock, spreading his gorgeous tail, stalked up and down in his most stately manner before a Crane, and ridiculed him for the plainness of his plumage. 'Tut, tut!' said the Crane; 'which is the better now, to strut about in the dirt, and be gazed at by children, or to soar above the clouds, as I do?'"

Aesop

"O friend, never strike sail to fear! Come into port greatly, or sail with God the seas. Not in vain you live, for every passing eye is cheered and refined by the vision."

Ralph Waldo Emerson

"Practice lifting your mind above the confusion around you. One way is to form mental pictures of great hills or mountain ranges, the wide sweep of ocean, some green valley spreading out below you. You can even hear skylarks if you listen carefully."

Norman Vincent Peale

PRESIDENT'S PAGE

DEAR DOCTOR:

If you were interpreting medical opinion on health standards to the Kansas legislature would you say—

That in the interests of public safety the people must require a minimum level of professional education of every practitioner in the healing arts before he is permitted to practice—

That the very least requirement shall be an understanding of anatomy, bacteriology, chemistry, pathology, and of physiology—

That the people may grant different degrees of practice rights and shall require a higher degree of education for broader privileges—

That when any school wishes to embrace techniques currently denied, it may earn such right by raising its educational standards—

That all this discriminates against no one and favors no one—

That it is for public protection which cannot be compromised without penalty exacted in lives—

That the whole problem is just that simple.

Or what would you say?

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

Healing Arts Act

The House of Delegates met at Wichita on Sunday, October 28, 1956, and authorized the Society to present to the 1957 Kansas legislature a Basic Science Bill. This would require all future chiropractors, doctors of medicine, and doctors of osteopathy to successfully complete an examination in anatomy, physiology, chemistry, bacteriology, and pathology given by a special board of science professors from state universities before being qualified to take an examination for a license to practice in this state.

The House of Delegates also authorized the introduction of a bill creating a Healing Arts Board consisting of representatives from the three groups named above and possibly one other. Every person now licensed in the state would retain his present privileges without curtailment, but Kansas osteopaths would be entitled to take an examination in medicine and surgery (just like the examination taken by the doctors of medicine) from the medical segment of the board for a license to use drugs and to practice surgery.

Other than that, applicants for licenses will be examined only by those members of the board who hold a license of the type sought by the applicant.

The executive secretary of the Kansas Medical Society was asked to appear before a meeting of chiropractors to explain how this proposal might benefit chiropractors. He presented the following before their meeting in McPherson on Sunday, December 16, 1956:

I welcome this opportunity to visit with you and shall make a sincere effort to evaluate, as I was invited to do, the benefits that would accrue to chiropractic from the passage of a Healing Arts Act.

To avoid any future misunderstanding about what I may or may not have said, these comments have been prepared in quantity and I am pleased to have you follow the copy with me as I read.

I also wish to state that my remarks have not been endorsed by the Kansas Medical Society so they are not necessarily the opinion of the Society. I believe, however, that I have here fairly expressed the philosophy of the medical profession of this state on the subject of standards for health care.

I hope that a small group of responsible representatives of your association and of the medical society can in the very near future meet for an extended and a frank discussion of this proposed piece of legislation, so a complete understanding can be reached and, if possible, at least a measure of agreement.

You surely understand that it would, therefore, not be appropriate for such discussion to take place at this time. I, therefore, respectfully state that I shall

leave when these comments are concluded and will await your further pleasure for a joint committee meeting.

You are in the process of evaluating chiropractic's position with reference to a Healing Arts Act for Kansas and would not have invited me to talk on the subject if you did not expect a thoughtful and an honest opinion. I promise I shall do my best to justify the time you have given me.

If this discussion is to be of any benefit whatever, it will require a little effort by all parties concerned. We will need to have confidence in each other, at least until proven false. We must respect our different opinions and as far as possible erase our prejudices. And, finally, you expect me to be frank even to the point of opinions with which you might not agree, otherwise the time spent in discussing this subject will be wasted.

The philosophy of the doctors of medicine in Kansas on the subject of practice rights has for many years been widely expressed. It will not be new to you, but for the purpose of starting together here is a brief review.

The right to practice the healing arts is not vested within any one group or school of healing. It is the people of Kansas who grant this right. Therefore, it is actually a privilege given to a few, but under the control of the public.

We have contended for many years, as you know, that the privilege to use drugs and to perform surgery with instruments is not given to the doctor of medicine as such. It is rather an expression by the people that a minimum standard of education is necessary before a physician may safely approach the public with such rights.

Until now only the doctor of medicine has met the Kansas standard, and therefore he only has a license giving him the right to use drugs and to perform surgery. As other schools improve their standards of education to equal those of medicine, they should and they WILL be granted equal practice rights. That is no departure from our position of many years standing. It has often been distorted and has often been misunderstood, but we steadfastly claim that the risk to the public is great enough under even ideal circumstances, and no compromise on these standards can be made with safety.

The use of drugs and the performance of surgery isn't the only hazard. Failure to recognize a patient's condition is one of the most serious of all errors committed in the healing arts. It stands to reason that the frequency of these mistakes and their seriousness will be in direct proportion to the lack of knowledge a physician has about the body, its functions, and its pathology.

I wish to apologize for the use of a simple illustration, but not being trained in any branch of the

healing arts, I cannot think of a more appropriate example than that of a watch. You expect your watch repairman to know what is inside this watch, to recognize the various pieces, their locations, and their functions. He should know enough about their appearance and how they work that failure of any part can readily be identified. He should be familiar enough with all these parts to recognize them out of location and even when only small portions of a part are shown. He should know what the parts are made of and why one piece is of different material than another.

Unfortunately, my simple illustration is not altogether accurate and cannot be followed to a definite conclusion, but we have in the crude example, I believe, all the elements of the five basic sciences.

Our interest in the basic sciences is only for protection of the public. We believe there must be a minimum level of education which any practitioner must have attained before he may be permitted to care for sick or for injured people. We are not particularly concerned over HOW he proposes to treat the patient. We are worried about whether he knows WHY he is treating the patient and what he is treating him for.

Since the public cannot individually defend itself against unqualified practitioners, it must do so collectively through laws. It is the sincere opinion of the Kansas Medical Society that a practitioner of the healing arts should know at least the basic things about the body and that the public has a right to demand that he show evidence of such knowledge before he is permitted to practice. Then the examination by his professional board will concentrate on questions relating to treatment methods.

Chiropractic has at times opposed basic science examinations, and the many various reasons, we believe, fall into two categories. It appears then that you may oppose this proposed legislation on one or the other of two general arguments.

You may claim that the principles of medicine are false (as did the early osteopaths) and declare that your single treatment of spinal adjustment and that alone is effective for all conditions. You would denounce surgery and reject medicine's diagnostic procedures on malignancy. You would deny the value of vaccinations and immunizations. You would say that drugs do not combat infection. If you do that, you could sincerely argue that you have no use for the knowledge of the basic sciences.

Should you elect that course, the medical profession will balance its discoveries against your belief and rest its case before the court of public opinion. This, if it is to be the stand of chiropractic in Kansas, will isolate your profession from the other healing arts.

Your only other possible objection is a public admission of inadequacy and lack of education. Here

you blame whatever you care to call responsible. Even if you were to adopt this course, the evidence from your own colleges and the record from your own practitioners in other states will refute you.

It is the inadequate, and only the inadequate, who fails to pass a reasonable basic science examination. Such a person, whether he be a doctor of medicine or a doctor of chiropractic, has no right to treat sick people. No reasonable person can deny the justice of that position, and I am sure the chiropractic association must agree.

Permit me to say this once again. The doctor of medicine resents the basic science examination about as much as you do, but this law is not written for the doctor of medicine. Nor is it written either for or against the doctor of chiropractic. The law is designed to protect the public against persons who are manifestly unqualified to treat disease because they cannot recognize it or to advise on physiology because they have no understanding of body functions. The chiropractic society, I honestly think, cannot take the stand that knowledge of these subjects is without value in caring for sick people, nor can it gracefully endorse the position that some minimum educational standard is not necessary for public protection. Chiropractic's only real problem then is whether it wants this level as high as or below that recommended by other branches of the healing arts.

Therefore, we hope your society will take the third alternative and either support the proposal or at least not actively oppose it.

Perhaps you already know, but this is what is being suggested under the so-called Healing Arts Act—that the practice acts of chiropractic, medicine, and osteopathy be repealed, that a composite board be created consisting of members from each of the three branches of healing with broad enforcement powers, and that each would examine only in its own field—that *not one* single practice privilege be taken from any person now licensed by any of the three boards, and that in the future a certificate issued by a board of basic science examiners be made prerequisite before the professional examination could be taken.

Now may I review. I have been frank. I have not intended to be disrespectful to anyone. I hope I have not left that impression, but neither have I tried to mislead you with a glossed-over account. I hope I have answered the question I was invited to discuss. I hope I have made clear our invitation to work out any disagreements that may exist in the details of the bill. We will do everything short of compromising our principles and short of endangering public protection to obtain your acceptance of this proposal. We hope you will want to place chiropractic under this act for exactly the same reason medicine proposes to be placed under this act—for public protection. And in the field of the healing arts, in the field of health

care, there is no benefit that can come to a profession greater than that of having contributed to the public safety, to the public health, and to the public well being.

So if I failed to make myself clear—this then is what chiropractic stands to gain. It will gain a place of respect in the healing arts professions, it will experience the confidence of having voluntarily raised its own standards, and most of all it will find the satisfaction of having been of service to the public. And I think that is reward enough. I thank you.

Save a Million Dollars a Year

We can show you how Kansas can save one million dollars a year. We and six other states, New Mexico, Arizona, Nevada, Wyoming, Idaho, and Montana, six mountain states and our plains state, can lead the nation.

Nor is there any secret about this. The Kansas legislature, hard pressed to reduce the budget without curtailing a single program, to raise the revenue without adding to a single tax, is welcome to the information.

The story concerns E.T.V., letters that youngsters and adults alike all over the east as well as in the deep south understand to mean Educational Television. The term will also be heard increasingly during the next few years in a tier of states two deep all around us because they either have or are planning E.T.V. We will scarcely ever use the term at all in Kansas because we are saving a million dollars a year and E.T.V. has no meaning in this state.

The important thing is that you have nothing to buy, nothing to do. Just sit perfectly quiet and on April 1 of next year, or sometime near that date, the Federal Communications Commission will release to commercial interests the channels that are now being held for E.T.V. It is just that simple and just that final—you have saved Kansas one million dollars a year—forever!

A million dollars a year is not peanuts. It will, in fact, buy every man, woman, and child in this state five ten-cent bags of peanuts during the year. It will just about cover the cost of one matinee motion picture performance a year for each person in the state. It is 50 cents apiece!

That same half dollar a year will in eight years build eight transmitter towers to cover every county in the state and supply daily, year round programs for anyone with a television set who wants to tune it in.

For 50 cents a year you can see programs of educational value from all over the world on almost every subject on earth. You will have locally produced concerts, speeches, and dramas from the universities and colleges of Kansas. You will have for-

mal classroom-type courses for children and for adults that can be taken for credit. Programs will be presented by the Kansas Medical Society, the Highway Patrol, the Industrial Development Commission, and many other societies and organizations.

For 50 cents a year you can turn on your television set with the knowledge that you will not have to watch a single commercial.

Of course you can do that only if you visit in Colorado or Nebraska or California, or in Louisiana, or anywhere in fact except in the six states named above. Because if the 1957 Kansas legislature has not taken at least a definitely committed step toward such a program, the eager commercial interests will be given the channels and that will be that.

Kansas will have saved one million dollars a year and will once again have demonstrated what this grand and unfathomable state has so often shown—that she either will be first and brilliant and heroic and outstanding or, failing that, she will be last or not at all.

Annual Meeting for 1957

A change in the format of the annual meeting of the Kansas Medical Society has been announced by the committee planning the event. The session will be held in Wichita from Sunday, May 5, through Thursday, May 9, 1957.

Although the complete program will not be available until later, an outline of the schedule has been arranged. The following listing of events gives the over-all picture.

The Kansas Chapter of the American Academy of General Practice will meet on Sunday afternoon and will hold its annual banquet that evening. A program will follow the banquet, then a business session for members and entertainment for their banquet guests. The group's scientific program will be presented on Monday morning, ending at noon so that members may join others of the Kansas Medical Society for sports events.

Monday afternoon will be devoted to golf and shooting, and the evening program will include the annual sportsmen's banquet and the awarding of prizes.


The scientific program usually scheduled for Tuesday morning of the session will not be held this year. Instead, beginning with a breakfast at 7:30, the time will be devoted to the first 1957 meeting of the House of Delegates. This will leave Tuesday evening free, which will be pleasing to many who objected to the former plan of holding the first House of Delegates meeting on Tuesday evening.

A nationally known speaker will address the Society on Tuesday afternoon, to begin the annual program. Later two in-state speakers will present papers

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on the general subject of geriatrics. Three more speakers will be heard on Wednesday morning, and the afternoon will be devoted to two panel discussions presented by six speakers. The subject discussed by one panel will be gastroenterology, and the subject of the other will be cardiovascular disease. Three additional papers will be presented on Thursday morning.

Since there will be special exhibits at the Wichita Forum this year, where the sessions will be held, there will not be room for luncheon sessions there. Consequently, the Broadview Hotel will be the scene of the one general luncheon on the schedule this year, on Wednesday noon. The annual banquet, as in the past, will be held on Wednesday evening and will be followed by a program.

The 1957 meeting will close after a second House of Delegates meeting on Thursday afternoon.

No plans have yet been announced by the Woman's Auxiliary to the Kansas Medical Society, the Kansas Medical Assistants' Society, and the many specialty groups made up of physicians, but these groups will also schedule meetings during the week. Announcements will be made as information is available, and complete programs will be published in the April issue of the JOURNAL.

International Medical Film Program

The international medical film program, a new feature of the American Medical Association's 1957 annual meeting, is creating considerable interest abroad, according to Ralph P. Creer, director of motion pictures and medical television, American Medical Association. Many applications are now coming in, indicating an extensive program of medical films made in other countries.

The aim of the film program is to bring before the doctors attending the meeting outstanding motion pictures produced abroad dealing with many aspects of medical science. This feature is in support of the "People-to-People" program which President Eisenhower launched this summer and in which medicine and the health professions are cooperating under the chairmanship of Dr. Louis H. Bauer, secretary-general of the World Medical Association.

Although the film program is in no way competitive, a certificate of participation will be awarded to each film of distinction selected for showing.

In connection with this film program, which is to be held at the Barbizon Plaza Hotel in New York City, June 3-7, 1957, a discussion is planned on the problems of a freer international medical film exchange. All country representatives interested in dissemination of medical knowledge by the film medium are invited. Special social events will also provide an opportunity for the participants to meet informally and discuss problems of mutual interest.

The film program will be scheduled so as to permit participants to visit scientific exhibits and other programs, including color television, as guests of the American Medical Association.

Applications for the program and further information can be obtained from the American Medical Association, Motion Pictures and Medical Television, 535 North Dearborn Street, Chicago 10, Illinois.

Medicine and music are universally conceded to be international languages. Perhaps there are many more. The experience of the lawyers compares with our experience as physicians, in that it reveals an unquenchable determination among men of every land and language to assert the dignity of the individual, his inviolable rights to freedom of action, and the subordination of government to those rights.—*World Med. J.*, May, 1956.

Citation to Ciba Pharmaceuticals

A citation to Ciba Pharmaceuticals, Inc., was awarded by the American Medical Association at its recent meeting in Seattle in recognition of Ciba's service to the medical profession through its national television series, "Medical Horizons."

The citation contained the following sentences. "By accurately and dramatically telling the story of medicine and medical progress through 'live' pickups from hospitals, medical schools, and research laboratories, you have given the general public a new insight into the work and achievements of its doctors. Because of these outstanding contributions to medicine, you have proved yourself deserving of this special recognition."

The current 39-program series includes programs produced at the Mayo Clinic, Sinai Hospital in Baltimore, Duke University, the University of Georgia, Rockland State Hospital in Orangeburg, New York, the U. S. Naval Base in New London, Connecticut, the University of Pennsylvania, the University of California, and the Cleveland Clinic.

Parke-Davis Research Center

Selection of a site in Ann Arbor, Michigan, near the University of Michigan campus, was announced recently by Parke, Davis and Company as the location for its new \$10,000,000 medical research center. A structure to be completed there by early 1959 will supplement present research facilities.

Approximately 400 workers are now employed in the firm's research division, and Parke-Davis announces a "substantial number" will be added when the new center is completed. Studies are going forward on cancer, cardiovascular diseases, mental disorders, virus diseases, and other health problems.

Clinicopathological Conference

Fatal Depression of the Granulocytic Leukocytes

CASE PRESENTATION

The subject of this conference was a 72-year-old white woman who was admitted to the University of Kansas Medical Center on December 31, 1955, with the complaint of sore throat and mouth. She had had a sudden onset of sore throat and painful ulceration of the oral mucous membranes on December 25, 1955. These symptoms were associated with intermittent fever up to 101 degrees, and because of the sore mouth she had been unable to take solid foods. Treatment with several medications, including oral penicillin, had given her no relief. The patient had lost 10 pounds since the onset of her illness.

She described a single episode of severe left chest pain which radiated into the left arm and shoulder and was associated with exertional dyspnea, sweating, and weakness about November 15, 1955. An electrocardiogram made at that time was reported to be normal. There was a six-month history of mild exertional dyspnea. She also had had a recurrent bearing-down pain in her lower abdomen which she said was similar to menstrual pain, and which was associated with one episode of vaginal spotting a month before her admission.

When she entered the hospital she was thin and appeared to be chronically ill. Her blood pressure was 140/80; pulse, 80; respiration, 20; temperature, 100 degrees, orally. There was an erythematous ulcer 1 cm. in diameter on the inner aspect of the lower lip. In the center of the ulcer was a yellow plaque 1 mm. in diameter. There was a grade I systolic murmur at the cardiac apex, and many fine crepitant rales were present in the left base. The liver edge was palpable at the right costal margin and was tender. Pelvic examination was negative except for moderate senile vaginitis. There were bilateral varicosities of the leg with a stasis dermatitis on the right leg.

The red blood count on admission was 4,400,000 with 12.8 gm. of hemoglobin, and the white count was 2,250 with 100 per cent lymphocytes. The urinalysis was negative. Serum electrolytes and blood urea nitrogen were normal on admission. The sedimentation rate was 24 mm. in one hour. The direct serum bilirubin was 0.2 mg. per cent; alkaline phos-

phatase, 5.3 units; bromsulphalein retention, 20 per cent; thymol turbidity, 13 units; cephalin cholesterol, 2 plus; prothrombin time, 65 per cent of normal. The serum albumin was 3.07 mg. per cent; the serum globulin was 2.93 mg. per cent.

Frequent platelet counts were consistently within normal limits, and daily blood counts showed essentially normal hemoglobin and red count. The white count was generally under 1,000 until January 9, 1956, and the differential showed 100 per cent lymphocytes until January 7, 1956, at which time 2 neutrophils appeared. On January 9 the white count was 2,200 with 18 per cent neutrophils, 56 per cent monocytes, and 26 per cent lymphocytes. Subsequent to this date the patient's white count rose rapidly, reaching 72,000 on January 14 with 85 per cent neutrophils. The direct Coombs' test was negative. The admission bone marrow biopsy showed generalized hypoplasia with aplasia of the neutrophilic elements.

Serum electrolytes were done almost daily, and on January 7 the sodium was 122 mEq/L; carbon dioxide, 22 mEq/L; and chloride, 90 mEq/L. These remained in this range until January 13, at which time the sodium was 129 mEq/L; potassium, 5.3 mEq/L; carbon dioxide, 21 mEq/L; and chloride, 105 mEq/L. The blood urea nitrogen rose gradually until January 12, when it jumped from 28 to 42 mg. per cent, and on January 14 it reached 69.5 mg. per cent.

A repeat hepatogram on January 9 showed a total bilirubin of 3.8 mg. per cent; alkaline phosphatase, 1.4 units; cephalin cholesterol, 3 plus; thymol turbidity, 19 units; serum albumin, 2.32 mg. per cent; serum globulin, 2.78 mg. per cent; and the total cholesterol was 136 mg. per cent with 26 per cent esters. The urine culture on January 3 grew out an enterococcus and a non-hemolytic *Staphylococcus aureus*, both of which were resistant to all antibiotics tested. Four blood cultures were negative at 10 days.

Shortly after admission the patient's temperature rose to 101 degrees, and for the next five days she had a septic temperature with peaks up to 102 degrees. There was gradual defervescence beginning on January 7, and for the remainder of her hospital course she was afebrile.

On January 1 she was started on 600,000 units of penicillin every six hours. The following day the dose was increased to 1,000,000 units every six hours, and corticotropin (ACTH) gel was begun in daily doses of 80 units. On January 5, 25 mg. of cortisone

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

every six hours was added. The patient seemed weaker and less alert, but her fluid intake and output remained fairly good.

She was given 250 cc. of fresh whole blood daily from January 5 to 10. Her condition became worse, however, and bilateral pneumonia developed. On January 6 she had marked tachycardia and hyperpnea which was only partially relieved by oxygen. Streptomycin and novobiocin were added to the antibiotic regimen. On January 7 abdominal distention and nausea were noted. The serum sodium was 122 mEq/L, and the urine output was 320 ml. She was given sodium chloride by mouth, but there was no improvement of her serum electrolytes.

By this time the patient was receiving 200 mg. of cortisone daily, and the corticotropin had been discontinued. On January 8 and 9 she was given 100 ml. of 5 per cent sodium chloride solution intravenously, but there was little change in the serum electrolytes, and the patient's abdominal distention and oliguria persisted. There seemed to be little, if any, progression of the pneumonia, although she had developed clinical icterus.

On January 10 it became necessary to give the patient additional intravenous fluids. On January 11 the pneumonia seemed to be increasing, and cyanosis developed even on change of position. The patient was placed in an oxygen tent and given increased doses of antibiotics. There was gradual deterioration, however, and early on the morning of January 14 she showed marked respiratory distress, and her blood pressure dropped to shock levels. She was given 137 mgm. of hydrocortisone intravenously with slight benefit, and by noon she was completely unresponsive and her respiration was extremely shallow and labored. She died at 4:30 p. m. on January 14.

Dr. Mahlon Delp (moderator): Are there any questions for Dr. Woods?

Curtis Drevets (fourth year medical student)*: I should like to know more about the abdominal distention. Was it tympanitic or dull to percussion, were bowel sounds heard, and was she passing stools?

Dr. Hugh J. Woods (resident in medicine): She was having bowel movements until she died. The abdomen was tympanitic, and the bowel sounds were considered to be normal until January 12. At that time they became hypoactive but were still present.

Question: What was the color of the stools?

Dr. Woods: They were not unusual.

Question: Was she on any treatment or medications before admission?

Dr. Woods: She was on several medications; the

only one we could positively identify was oral penicillin.

Courtney Clark (fourth year medical student): What medications were given to her about the middle of November?

Dr. Woods: The treatment at that time consisted mainly of bedrest. She was given one or two hypodermics.

Paul Bartholow (fourth year medical student): Did she have a history of any allergies?

Dr. Woods: No.

Warren Baker (fourth year medical student): Were urinary electrolytes determined in this hospital?

Dr. Woods: No.

Mr. Drevets: What was the course of her fluid output?

Dr. Woods: Her output until January 4 was essentially normal. We have no record on January 5. On January 6 it was 650 ml.; on the 7th, 350 ml.; on the 8th, 880 ml.; on the 9th, 685 ml.; on the 10th, 450 ml.; on the 11th, 280 ml.; on the 12th, 90 ml.; and on the 13th it was 70 ml.

Daniel Boone (fourth year medical student): Was there any pigmentation of her neck?

Dr. Woods: No.

Mr. Boone: Was she jaundiced?

Dr. Woods: No.

Mr. Clark: Were any skin tests done?

Dr. Woods: No.

Charles Bascom (fourth year medical student): What kind of sodium and food intake did she have before she came to the hospital, and did she eat while she was here?

Dr. Woods: She had fairly adequate oral intake until January 7. She was on a low salt diet because of the steroid medication.

Dr. Delp: She had not been eating well because she had a sore mouth.

Mr. Bartholow: Did she have edema or ascites at any time?

Dr. Woods: We thought that there was some ascites, and she developed edema of both extremities after January 7.

Question: Was the spleen palpable?

Dr. Woods: No.

Dr. Jacob Frenkel (pathologist): What did the sputum cultures show, and what did you think caused the pneumonia?

Dr. Woods: The bacteriology laboratory reported "usual flora."

Dr. T. K. Lin (cardiologist): What was the specific gravity of her urine the last few days?

Dr. Woods: The specific gravity was not done in the last few days. There were three routine urinalyses which showed 1.005, 1.022, and 1.014.

* Though a medical student in May, 1956, when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1956.

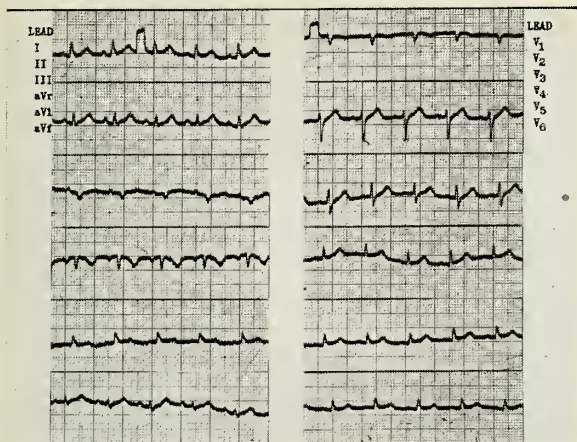


Figure 1. Electrocardiogram, January 2, 1956.

Dr. Delp: Mr. Bartholow, will you please present the electrocardiograms?

Mr. Bartholow: The first electrocardiogram was taken on January 2 and shows a rate of approximately 100 with a regular sinus rhythm (Figure 1). The P-R interval is approximately 0.14 seconds, and the QRS interval is approximately 0.1 second in most of the leads. The RST segments are isoelectric; both the limb and the chest leads show slight segment elevation, but it is not consistent. The T waves are normal and upright. The position of the heart is horizontal. I interpret this as a normal electrocardiogram.

Dr. Delp: Do you think that the patient had a myocardial infarct in the middle of November?

Mr. Bartholow: Not from this tracing.

Dr. Delp: Mr. Boone will now present the x-rays.

Mr. Boone: The chest film (Figure 2) made on the second hospital day shows calcification in the costochondral junctions, mild osteoporosis, and a mildly emphysematous left chest. The heart is within normal limits. There is a primary Ghon complex in the right upper lobe and a linear infiltration in the right apex. There is increased hilar density on the left and a density in the left base. Considering the clinical findings, I interpret this as pneumonia, although neoplasm, atelectasis, and pleural effusion must be considered.

A lateral chest film taken the same day shows a compression fracture of the fourth thoracic vertebra, osteoarthritic lipping of the vertebra, and calcification of the aorta. There is a density or haziness in the base which is difficult to interpret because of the diaphragm on the opposite side.

The kidney-ureter-bladder film taken on the fifth hospital day shows the intestines pushed over to the right side. I get the impression of a soft tissue mass compressing the intestines which contain some gas.

The psoas shadows are poorly defined, and I am unable to make out the kidney shadows.

Dr. Delp: Dr. Germann, do you have any comments?

Dr. Donald R. Germann (radiologist): She had generalized demineralization of the bones. I would not be inclined to call that a fracture of the thoracic spine. Instead, I think it is demineralization associated with developmental kyphosis that occurs in older people.

Dr. Delp: Thank you. Mr. Drevets will now give his differential diagnosis.

DIFFERENTIAL DIAGNOSIS

Mr. Drevets: The patient for discussion today was a 72-year-old woman who was hospitalized here on December 31 after an illness of six days. Her complaints were fever, sore throat, and painful ulcerations in the mouth. She received no relief from various medications. There was a history of chest pain approximately six weeks before admission. The main physical findings on admission were that she was critically ill in appearance, there was an ulceration of the lower lip, she had fever and basilar rales in the left chest, and the liver was tender and palpable.

The laboratory reported severe leukopenia and agranulocytosis, but it is noteworthy that she had no anemia or thrombocytopenia. The bone marrow showed hypoplasia with neutrophilic aplasia. The hepatogram was slightly abnormal.

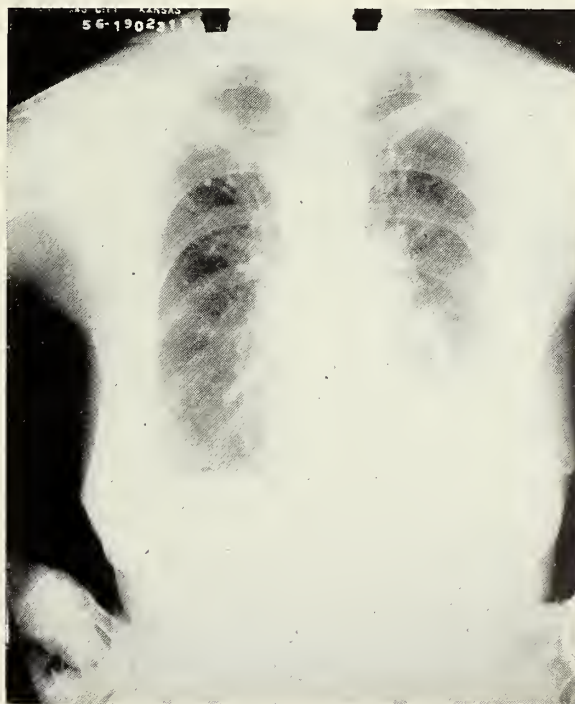


Figure 2. Chest film made on the second hospital day.

She was given corticotropin, cortisone, penicillin, streptomycin, novobiocin, and blood. After seven days her white blood count began to rise, and neutrophils began to appear. She continued to have evidence of pneumonia, and there was a fall in the serum sodium with a normal alkali reserve. She was given salt by mouth and by vein, but she did not respond. She became progressively worse with oliguria, nitrogen retention, abdominal distention, cyanosis, hyperpnea, and shock. She died on her 15th hospital day.

I shall base my differential diagnosis on the neutropenia, for which there are three main causes. First I shall consider infections. The most prominent bacterial infections are brucellosis and typhoid fever, but one usually does not find complete agranulocytosis in either of these. Furthermore, there are no blood cultures or serological tests to help us make this diagnosis, and the history and physical findings do not fit. I rule out protozoan infections on the same basis. Viral infections such as influenza, rubeola, infectious hepatitis, and infectious mononucleosis can cause a granulocytopenia, but it is usually not as severe as in our patient. There are no serological tests or physical findings to go with these diagnoses. There are certain other overwhelming infections such as sepsis, but the history and physical findings hardly go with these. Tuberculosis is something that we should consider, because there have been cases reported in which miliary tuberculosis was present, but was totally unsuspected in the presence of a leukopenia such as this patient had. In miliary tuberculosis or severe tuberculosis there usually is an infiltration of the bone marrow and a generalized depression of all blood elements.

There are other conditions involving hypersplenism including Felty's syndrome, splenic vein thrombosis with Banti's syndrome, and cirrhosis with hypersplenism. In these cases the spleen is almost always palpable. In Felty's syndrome there is an associated arthritis, and we have no other physical findings to go with these diseases. Furthermore, they rarely cause complete agranulocytosis.

Hematopoietic disorders such as aplastic anemia and pancytopenia cause anemia and thrombocytopenia which were not present in this case. At first glance this may look like aleukemic leukemia, but the four diagnostic criteria for this are lacking: anemia, thrombocytopenia, hemorrhagic tendency, and immature blast cells in the peripheral blood.

I now come to my diagnosis which is agranulocytosis. Patients with this disorder are usually over 40 years old, and women are involved three times as often as men. It is usually a brief illness with an acute onset, and patients have a pronounced leukopenia with decreased or absent granulocytes. The complete absence of granulocytes is almost pathog-

nomonic of agranulocytosis. This patient had a count below 1,000 for several days, and there were no granulocytes in the blood for at least seven days. There was no significant anemia, thrombocytopenia, or hemorrhagic tendency. Immature cells were never found in the peripheral blood. Furthermore, there was no lymphadenopathy or splenomegaly. These patients almost always have necrotic areas in the mucous membranes of the mouth, pharynx, gastrointestinal tract, and vaginal mucosa, and our patient had at least one ulceration. Such ulcerations typically have no polymorphonuclear reaction and no pus formation. The liver biopsy is compatible with agranulocytosis. In most cases there is degeneration and central necrosis of the lobules of the liver. There is also parenchymatous degeneration of the kidney. This patient had had some abnormal liver function studies, and she evidently had some renal dysfunction also.

There are numerous classifications of agranulocytosis. I like the one of Rohr.³ He divided them into post-irradiation, toxic, and anaphylactic. We have no history of the first two; therefore, I conclude that this was anaphylactic or sensitization to a drug. There is no history of any specific drug, but we know she had several. Agranulocytosis is probably caused by agglutinins, and the destruction appears to be peripheral, although in years past it has been said to be an anaphylactic inhibition of the bone marrow.

We must consider the clinical course of our patient. She was put on corticotropin and cortisone, the treatment currently accepted for agranulocytosis, and she had a typical response. The response starts with a few polymorphonuclears followed by a compensatory monocyte response and later by a tremendous neutrophilia. Approximately one-half of the patients die of bronchopneumonia, and we have evidence of pneumonia in this patient.

Next I want to bring out the possibility of a low salt syndrome. I think that this is a relative thing, but our patient had several criteria of a low salt syndrome. She had lethargy, weakness, stupor, anorexia, partial ileus, decreased blood pressure, oliguria, nitrogen retention, and decreased serum electrolytes in the face of a normal alkali reserve. The oliguria apparently developed after she was started on transfusions.

I believe that she also had heart disease. She was in the age group for coronary insufficiency, and she had been having exertional dyspnea and chest pain. This could have been early failure.

I think that her primary diagnosis is agranulocytosis of the anaphylactic type with liver and kidney damage. She was beginning to recover, but the complications of pneumonia, possible septicemia, renal damage, fluid and electrolyte disturbances, and arteriosclerotic heart disease caused her death.

CLINICAL DISCUSSION

Dr. Delp: Mr. Boe, this patient had pain in the chest last November. Do you think it was cardiac in origin?

John Boe (fourth year medical student): I think that it was caused by cardiac ischemia.

Dr. Delp: Do you agree with that, Mr. Cramm?

Russell Cramm (fourth year medical student): At the age of 72 it is possible, even though it did not show on the electrocardiogram.

Dr. Delp: What is your opinion, Mr. Bascom?

Mr. Bascom: I thought of a pulmonary infarct.

Dr. Delp: Mr. Bartholow?

Mr. Bartholow: I do not think we can say whether it was coronary or pulmonary embolus.

Dr. Delp: Did you think it was cardiac in origin, Mr. Drevets?

Mr. Drevets: I thought so until I saw the electrocardiogram.

Dr. Delp: You did not mention the electrocardiogram when you built up this case for arteriosclerotic heart disease. Perhaps the protocol did not explain that this pain was diffuse in the left chest, in the lower abdomen, and in the left shoulder. Does this mean anything to you, Mr. Boe?

Mr. Boe: Well, it makes one consider pulmonary infarct, as mentioned, and something disturbing the diaphragm.

Dr. Delp: Mr. Bascom?

Mr. Bascom: She had splenomegaly. It could have been a splenic infarct.

Dr. Delp: When the patient came into the hospital she had findings in the left chest. Does this suggest anything to you, Mr. Baker?

Mr. Baker: Diaphragmatic irritation from splenic infarct or pulmonary abscess.

Dr. Delp: Did you see any abscess in the x-ray?

Mr. Baker: No.

Dr. Delp: Mr. Boe, what do you think about the steroids that this patient received?

Mr. Boe: With the little bit of knowledge that the medical profession has of the treatment of agranulocytosis, it is natural that they should try steroids. This treatment turned out to be successful, and it succeeded in changing this patient's blood picture. Complications of steroid therapy are multiple, and certain of them showed up in this patient. I do not think the physicians had any choice; they had to use steroids.

Dr. Delp: Mr. Cramm, why do you think this patient developed such low serum sodium and chloride?

Mr. Cramm: One possible reason was that she had been sweating for approximately 10 days. Another reason might be the fact that she had pneumonia

because sodium sometimes goes into the consolidated areas.

Dr. Delp: Mr. Bascom, do you have any other ideas?

Mr. Bascom: She may have had a salt losing nephritis.

Dr. Delp: Mr. Clark, what do you think about the five transfusions that were given to this patient?

Mr. Clark: It is a treatment for agranulocytosis. Whether it helps I do not know, but her oliguria developed shortly after this.

Dr. Delp: Mr. Cramm, why was this patient jaundiced?

Mr. Cramm: Sturgis⁴ said that approximately half of these patients do develop jaundice on the basis of hepatic destruction.

Dr. Delp: What causes this destruction?

Mr. Baker: I would say the toxic effects of a septicemia.

Dr. Delp: Did she have a septicemia? What about the blood cultures, Dr. Woods?

Dr. Woods: They were all negative.

Dr. Delp: Why did this patient become oliguric, Mr. Boe?

Mr. Boe: I would say that there was acute renal shutdown; lower nephron nephrosis is quite common with dehydration with or without shock.

Dr. Delp: Dr. Wilson, will you discuss this patient?

Dr. Sloan Wilson (hematologist): This tragic disease is usually physician-induced. This creates a problem from the diplomatic and therapeutic point of view. There is another problem with which we are faced when we see these people, that is the analysis of the bone marrow in which we see two distinct types of tissues (1) an aplasia of the granulocytes, and (2) a maturation arrest. The prognosis in the latter is much better than in the former.

Also one is impressed by the fact that, when first seen, these patients often look good. This patient did not look bad when I first saw her. A note was made on her chart that she was probably going to become much sicker, which was a mild understatement as we know now. Formerly practically all of these patients with a complete agranulocytosis of the marrow tissue died, but since the advent of corticotropin and the adrenal cortical steroids the prognosis is much better.

The liver damage is apparently part of this picture just as it is a part of any prolonged septic state. I do not believe it is drug induced.

Dr. Delp: Dr. Mantz will present the pathologist's report.

PATHOLOGICAL REPORT

Dr. Frank A. Mantz (pathologist): The external examination of the body confirmed the fact that this

was a poorly nourished elderly woman with diffuse icterus. In addition to this there was marked cyanosis of her lips, mucous membranes, and nail beds, and edema of her lower extremities. It is noteworthy that there was no significant pallor of the cutaneous surfaces, mucosal surfaces, the serous surfaces, or the sclerae. Likewise no petechial hemorrhages were found.

A careful examination of the mucous membranes throughout the body disclosed that there were indeed a few ulcers scattered throughout the mouth. One of these, and the most conspicuous one, was located at the base of the tongue at its junction with the epiglottis. This consisted of focal necrosis and erosion of the mucous membrane with deposition of a fibrinous exudate in the base containing a few inflammatory cells, the majority of which were mononuclear. Similar ulcers were present within the ileum and the bladder. The ileal ulcers were associated with hemorrhage into the lumen of the bowel, and in the bladder there was an inflammatory reaction which showed evidence of early suppuration. Ulcerations of the esophagus and rectum were also present, but may be

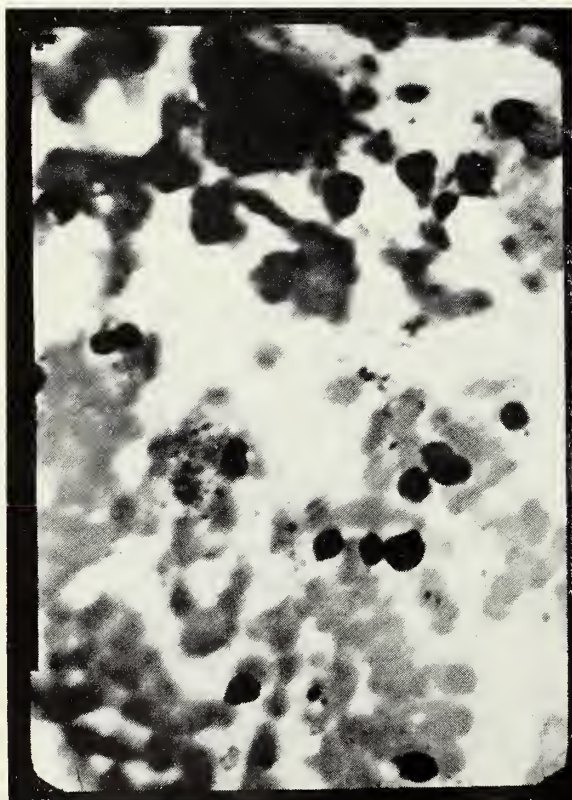


Figure 3. Sternal bone marrow smear obtained by aspiration on hospital admission. Note paucity of nucleated cells which in this field are exclusively erythropoietic. Several platelets are seen as well.

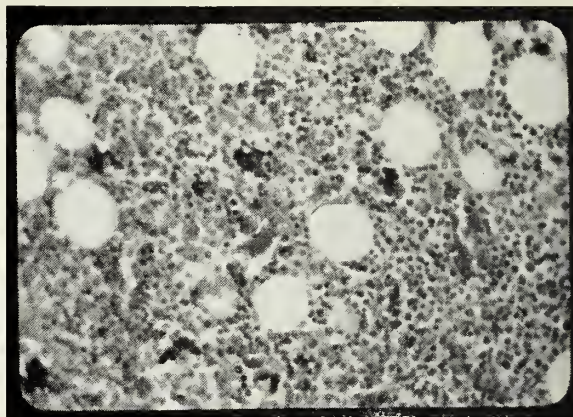


Figure 4. Sternal bone marrow obtained at autopsy. There is no distortion of architecture, but the marrow is crowded with immature and mature cells representing all phases of hematopoiesis. Immature myeloid cells predominate.

accounted for by the fact that the patient had indwelling catheters into the stomach and the rectum.

It has been stated that the characteristic bone marrow pathology in agranulocytic angina is, on the one hand, that of almost total aplasia of the myeloid elements and on the other, a hyperplasia of myeloid elements with a maturation defect showing arrested development at approximately the myelocytic level.¹ The sternal marrow aspiration performed by Dr. Wilson (Figure 3) showed an adequate number of megakaryocytes and numerous platelets scattered throughout with the majority of the cellular elements being of the erythroid series. Few myeloid cells were found.

It is significant that clinically there ensued a pseudoleukemoid state during the last three days of life. It is not surprising, therefore, to find that the post-mortem bone marrow (Figure 4) shows an extreme degree of hyperplasia, unassociated with any degree of altered architecture. The sinusoids are well defined, and the arrangement of the fat cells is relatively normal. Within the sinusoids one sees ample numbers of budding erythrocytes, showing that erythropoiesis was adequate and a normal number of megakaryocytes were present. The problem is to explain the large numbers of cells which fill the intersinusoidal spaces.

A Giemsa stain shows that these cells almost uniformly contain a granular type of cytoplasm. The significant feature is that there is an apparently normal maturation of cells extending from the myeloblast phase all the way through promyelocytes with a great preponderance of myelocytic elements. It appears that maturation is perfectly normal up to the myelocytic phase. This is not the bone marrow that one ordinarily

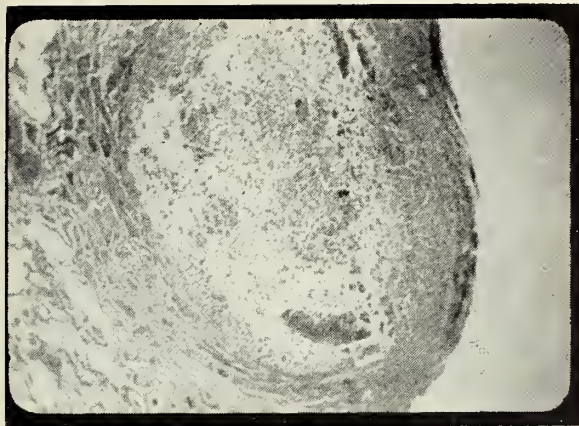


Figure 5. Lung. A large subpleural abscess with surrounding atelectasis and organizing fibrinous pneumonia from the left upper lobe.

sees in leukemia because the architecture is well preserved, and there is no evidence of leukemic proliferation in the lymph nodes, in the spleen, or in any of the other organs. Also, we see no changes involving erythropoiesis or thrombopoiesis.

The lungs showed a diffuse pleuritis with fibrinous exudate binding the surfaces to the parietal pleura. They appeared to be somewhat collapsed and atelectatic. The entire lower lobe of the left lung was uniformly consolidated and appeared to be chronically so. Similar areas of almost nodular consolidation were scattered throughout the remainder of the lung. Sections showed that the pneumonic process was mainly chronic and fibrinous.

Of greater interest was the presence of numerous abscesses scattered throughout the lung (Figure 5). These were almost uniformly of subpleural distribution. These abscesses ranged from one to five centimeters in diameter, the largest being found in the superior segment of the left lower lobe. This abscess had eroded into a bronchus, suggesting the possibility of widespread dissemination of inflammatory material throughout the lungs via the bronchi, and had ruptured through the pleural surface, soiling the pleura and creating an intense pleuritis which involved the undersurface of the lower lobe and the diaphragm.

The peritoneum was the site of a diffuse inflammatory process. The loops of bowel were uniformly dilated but unobstructed, and they were held together by a thick plastic fibrinopurulent exudate.

Cultures, carefully taken at the time of autopsy, grew out hemolytic *Staphylococcus aureus* from the lung, the pulmonary abscesses, the pleura, and the peritoneum. The heart's blood was sterile.

The liver appeared to be slightly swollen and flabby and showed a significant degree of jaundice.

There was, however, no evidence of active or extensive necrosis, nor was there evidence of distortion of architecture. The periphery of the liver showed a zonal type of degenerative change manifested by fatty metamorphosis. In addition, the individual liver cells themselves seemed to be quite swollen. So great had been this swelling that the sinusoids were relatively narrowed (Figure 6). The canaliculi showed evidence of bile retention in the form of thrombi which actually extended between the cells, and in some instances into the cells themselves (Figure 7). This is a picture of a moderately severe toxic hepatitis. Among the causes of this condition we may list organic arsenicals, testosterone, and chlorpromazine (Thorazine).² It is significant to note that chlorpromazine has also been incriminated as a cause of agranulocytosis.

The fact that the patient suffered a progressive oliguria occasioned careful study of her kidneys in the laboratory. The right kidney was surgically absent. The left kidney was somewhat heavy, weighing 180 gm., and was soft and flabby. There was pallor of the cortex, whereas the medulla showed the dark red streaking of hyperemia. Certain classical changes were

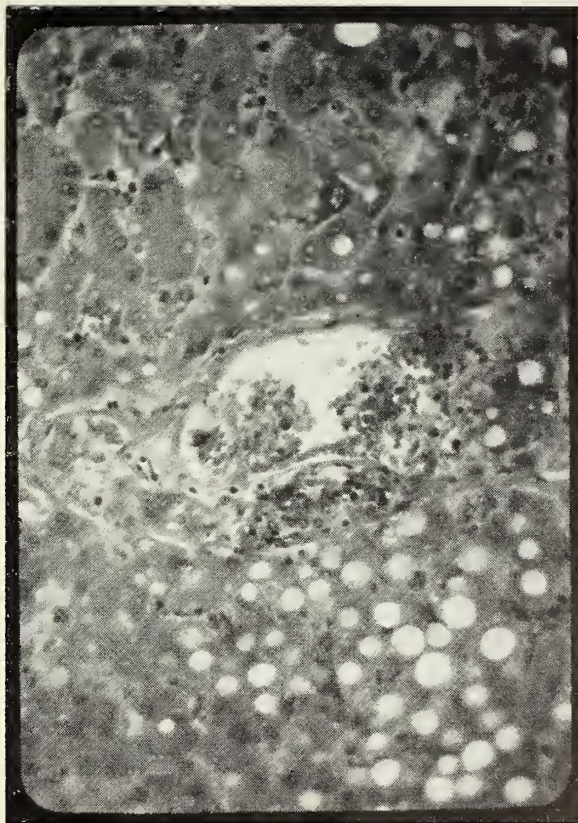


Figure 6. Liver. Toxic hepatitis showing swelling and fatty metamorphosis of liver cells at the periphery of lobules with compression of sinusoids and bile canaliculi.

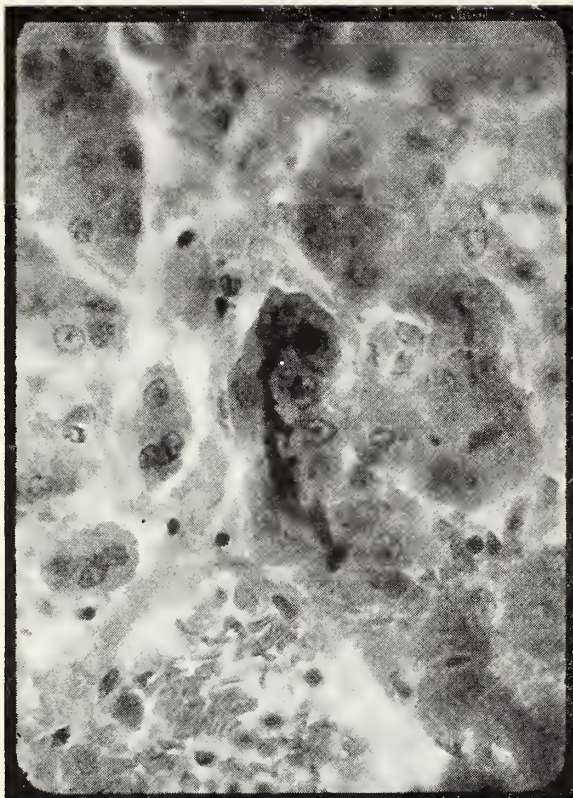


Figure 7. Liver. Toxic hepatitis showing bile retention in canaliculi and polygonal cells in central portion of lobule.

seen under microscopic examination. First, the glomeruli appeared to be relatively ischemic. Contained in Bowman's capsule was an abundance of fine granular precipitate presumed to be albumin. There was a parenchymal interstitial edema which tended to separate one tubule from another. The tubules were dilated and showed degenerative changes of the lining epithelium. A few casts were scattered about and were fairly well confined to the distal convoluted tubules. In addition there was some destruction of the epithelium lining the distal convoluted tubules. To complete the picture of lower nephron nephrosis, there was evidence of an inflammatory infiltrate, usually in the form of an endophlebitis, located for the most part in the arcuate vessels at the cortical medullary junction.

In some sections there is perhaps a clue as to a possible etiological agent. Scattered about there were intratubular crystals which could be visualized as relatively rounded bodies, often pie-shaped and sometimes irregular and spiculate (Figure 8). They were associated with a moderate degree of cellular degeneration of the epithelial cells in the tubules. These crystals were found to be birefringent and to have

a classical appearance of spicules arranged in sheaf-like fashion, an appearance which strongly suggests the sulfonamide drugs. It is impossible to conclude definitely that these are sulfonamide crystals, for we must acknowledge the fact that lysine, an amino acid often excreted in the urine in states of liver damage, can also assume this form. The absence of necrosis in the liver makes amino-aciduria rather unlikely.

To summarize, it is our belief that this woman did suffer from an agranulocytosis of the myeloid aplasia type, and that, as a result of the loss of the primary cellular factors in host resistance, she developed pneumonia which ultimately went on to necrosis of the lung with rupture into a bronchus and wide dissemination. Simultaneous with the onset of the infectious complication she was undergoing marked regeneration and myeloid hyperplasia of the bone marrow. This may have come about first of all as a natural course of her disease; secondly, as a result of the stimulation to myeloid proliferation by corticosteroid drugs, or, third, as a possible result of tissue necrosis with the release of leukocyte-promoting factors. The ultimate cause of her death was sepsis, to which a lower nephron nephrosis contributed heavily.

Dr. Delp: Thank you, Dr. Mantz. I would like

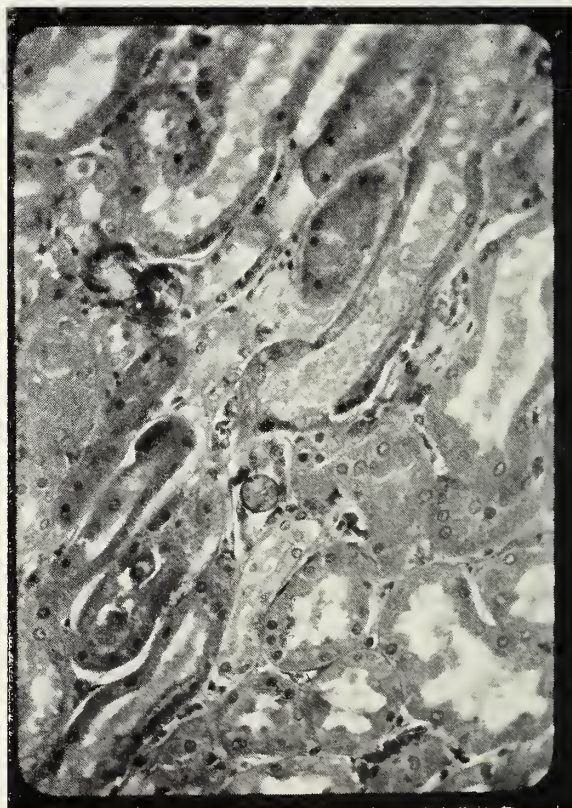


Figure 8. Kidney. Lower nephron nephrosis with sulfa-like crystals deposited in tubules.

to ask Dr. Rising whether he thinks Dr. Mantz is justified in possibly incriminating sulfonamides.

Dr. Jesse D. Rising: He may well be. One would expect a history of sulfonamides, and I would be a little surprised at a sulfonamide in this day and age because sulfapyridine was the last member of this group to cause leukopenia with any regularity. Phenylbutazone (Butazolidin) is the dangerous drug in common use today. Aminopyrine is the classical drug to cause agranulocytosis without any other change in the blood picture, whereas most drugs commonly depress several of the blood elements.

Dr. Delp: Dr. Weber, what do you think about this problem?

Dr. Robert Weber (internist): When the patient came in she was well oriented, and I showed her chlorpromazine. She had not taken it. I showed her chloramphenicol, and she had not taken it. I do not know what may have been the cause of this.

Dr. Delp: I have the impression, Dr. Weber, that although the steroids are probably helpful in this disease, one of the real reasons a good many of the patients recovered in the last 10 or 15 years was because of the use of penicillin. Do you think that we used adequate doses of penicillin on this patient?

Dr. Weber: I doubt that we could have given penicillin in adequate doses, considering the organism.

Dr. Delp: That point is well taken. This patient probably could not recover because of the renal lesion, but she died of a ventilatory failure. This clinical point is worth making. Her chest findings became much more marked the last three days of her life. I suspect rather strongly that this occurred because of the fact that she had a leukocytosis. Her lesions were not purulent up until the time she developed her 15,000 white count, and then 40,000, and then 70,000. Until that time she must have had the process going on all right, but when she died she must have suffocated from rupture into the bronchus because death occurred rather suddenly. Within the matter of an hour or two she became extremely dyspneic, and we could not control it with oxygen or any other means.

Dr. Chauncey Bly (pathologist): We hear about the increasing use of sulfisoxazole (Gantrisin) on the assumption that it is completely soluble everywhere. It seems to me that we are seeing quite a few of these refractile crystals, with or without the bile coloring, in the distal tubules where the dehydration is going on. I wonder if it is as innocuous as is commonly thought. Do you know, Dr. Rising?

Dr. Rising: Sulfisoxazole actually is not quite as soluble as is the combination of sulfamethazine, sulfamerazine, and sulfadiazine, combined in equal quan-

ties. It is more soluble than an equal dose of any one of the three, but it is not completely soluble, nor is it completely innocuous. I expressed myself poorly a minute ago about sulfapyridine. Other sulfonamides can cause agranulocytosis, but sulfapyridine happens to be the most common offender in this regard. So far as I know, all sulfonamides can cause bone marrow depression, and acetazolamide (Diamox) which is a sulfa derivative is no exception in this respect. I predict that the new hypoglycemic sulfonamide derivatives such as carbutamide and tolbutamide (Orinase) will also cause some cases of severe hematologic reactions.

PATHOLOGICAL ANATOMICAL DIAGNOSIS

Primary

Ulceration of the base of the tongue (history of sore mouth and throat for 19 days and of severe leukopenia for two weeks before death and the demonstration of myeloid hypoplasia by bone marrow aspiration 10 days before death).

Acute and chronic bronchopneumonia of all lobes of both lungs, advanced, with multiple acute and organizing subpleural abscesses (history of radiological diagnosis of pneumonia of the lower lobe of the left lung two weeks prior to death).

Rupture of a large pulmonary abscess in the lower lobe of the left lung, into a bronchus and through the pleura with acute fibrinopurulent pleurisy throughout the left thoracic cavity and acute left diaphragmitis (recovery of non-hemolytic *Staphylococcus aureus* by culture at autopsy).

Acute generalized fibrinopurulent peritonitis (recovery of non-hemolytic *Staphylococcus aureus* by culture at autopsy).

Generalized gaseous dilatation and distention of small and large intestines, moderate (history of total absence of bowel sounds on abdominal auscultation on the day of death).

Acute cystitis, moderate, with multiple mucosal abscesses (history of urine culture 10 days prior to death yielding enterococci and non-hemolytic *Staphylococcus aureus* resistant to all standard antibiotics).

Generalized hyperplasia of bone marrow, preponderantly myeloid, with left shift, severe (history of treatment with corticotropin for two weeks and with cortisone for 10 days prior to death; history of increasingly severe leukocytosis with left shift for three days prior to death).

Dilatation of the heart, predominantly of right side.

Acute passive congestion of the liver and gastrointestinal tract.

Cyanosis of the finger nails and of the oral mucous membranes, moderate.

Acute toxic hepatitis with bile retention, moderate, consistent with chlorpromazine intoxication.

Generalized icterus, moderate (history of elevated serum bilirubin to 3.8 mgm. per cent five days prior to death).

Lower nephron nephrosis with sulfonamide-like crystals in the renal tubules, moderate (history of oliguria throughout terminal hospital course).

Pitting edema of the hands and lower extremities (history of reduced total serum protein).

Multiple ulcers of the ileum.

Lipid depletion of the adrenals.

Acute ulcerative esophagitis.

SUMMARY

Dr. Delp: The uncommon, but not rare, clinical entity of agranulocytic angina is reproduced in classical form in this case report. Missing is the identity of the causative agent, but the differentiation from any form of leukemia seems clear.

Hematological response to administration of the steroid was good; nevertheless the patient failed to recover. Lack of the usual inflammatory reaction in the lung during the agranulocytic phase was followed by an intense purulent reaction with a return of large numbers of granulocytes and abscess formation. Death was finally typical of ventilatory failure following rupture of the abscesses.

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Mid-West Cancer Conference

Interest in the Ninth Annual Mid-West Cancer Conference, to be held at Wichita on Thursday and Friday, March 7 and 8, has been stimulated with announcement of the list of guest speakers. Those to take part are: Dr. Vincent P. Collins, Houston; Dr. Wilhelm C. Hueper, Bethesda; Dr. John H. Lawrence, Berkeley; Dr. Walter T. Murphy, Buffalo; Dr. Joseph H. Pratt, Rochester, Minnesota; Dr. Lee Stoddard, Augusta, Georgia; Dr. Grantley W. Taylor, Boston, and Dr. John M. Waugh, Rochester, Minnesota.

Dr. Collins is professor of radiology and chairman of the department of radiology at Baylor University College of Medicine. He also serves as consultant in radiology for the Veterans Administration Hospital in Houston, for Brooke Army Hospital at

Fort Sam Houston, for the Armed Forces Institute of Pathology in Washington, and for the Oak Ridge Institute of Nuclear Studies. He was graduated from the University of Toronto Faculty of Medicine in 1937 and successively served in teaching positions there and at Columbia University. He is a diplomate of the American Board of Radiology.

Dr. Hueper is chief of the Environmental Cancer Section of the National Cancer Institute. He studied at various universities in Germany, receiving his medical degree from the University of Kiel in 1920. He came to this country in 1924 and became a citizen in 1929. In Chicago from 1924 to 1930, he served as pathologist and director of laboratories for Mercy Hospital and associate professor of pathology at Loyola University School of Medicine. He was then affiliated with the University of Pennsylvania until 1934, when he became director of laboratories at Uniontown Hospital, also in Pennsylvania. Dr. Hueper later was assistant director and principal pathologist at Warner Institute for Therapeutic Research in New York, leaving there in 1948 to begin his present work. He is a diplomate of the American Board of Pathology.

Dr. Lawrence is a speaker who is making his second appearance at the conference. He was on the program at the 1949 meeting and was well received. Dr. Lawrence is director of the Donner Laboratory and professor and chairman of the division of medical physics at the University of California School of Medicine. His chief fields of research are biological effects of radiation, isotopes in clinical and experimental medicine, high altitude physiology, metabolism of normal and cancer tissues, and diseases of the blood. He was a member of the U. S. delegation to the International Conference on Peaceful Uses of Atomic Energy at Geneva and later served on a State Department mission to Thailand and Pakistan to advise on the development of atomic energy in medicine.

The subjects discussed by Dr. Murphy will be in the field of radiology. He is director of radiology at the Roswell Park Memorial Institute and consultant in radiation therapy to the Veterans Administration Hospital in Buffalo. His teaching assignment is as assistant clinical professor of radiology at the University of Buffalo Medical School. He is a diplomate of the American Board of Radiology.

Dr. Taylor, who is assistant clinical professor of surgery at Harvard Medical School, received his medical degree from that school in 1922. He is also tumor consultant at the Veterans Administration Hospital in Boston and at the Soldiers' Home in Jamaica Plain. He now serves as a member of the Board of Governors of the American College of Surgeons.

The second surgeon to participate in the confer-

ence is Dr. Waugh, head of a section in general surgery at Mayo Clinic and professor of surgery at the Mayo Foundation Graduate School, University of Minnesota Medical School. He is a diplomate of the American Board of Surgery, a fellow of the American College of Surgeons, and a member of the American Surgical Association, the Western Surgical Association, and the American Gastro-enterological Association.

Biographical material about the two other speakers on the scientific program and the banquet speaker will be published in the February issue of the JOURNAL, along with the program for the conference.

Those planning to attend should make hotel reservations immediately. All sessions will be held at the Broadview Hotel, Wichita.

COUNTY SOCIETIES

New officers of the Barton County Society were elected at a meeting held at Great Bend last month. Dr. Thomas J. Brown, Hoisington, was named president, Dr. Clair J. Cavanaugh, Great Bend, was re-elected vice-president, and Dr. Charles Replogle, Great Bend, was chosen to serve again as secretary.

Dr. Stanley L. VanderVelde was named president of the Lyon County Society at a meeting held at Emporia on December 11. Dr. Walter Luedtke is the new vice-president, and Dr. C. Herbert Munger is serving again as secretary-treasurer. Delegates to the 1957 meeting of the state society are Dr. VanderVelde and Dr. C. C. Underwood. The program for the December meeting consisted of a paper, "Pre- and Postoperative Care of Patients," presented by Dr. Thomas P. Butcher.

Officers of the Montgomery County Society for 1957 are: Dr. William G. Chappuie, Independence, president; Dr. John F. Coyle, Coffeyville, vice-president; Dr. Albert E. Bair, Independence, secretary, and Dr. Gerald C. Bates, Independence, treasurer.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was speaker at a meeting of the Sedgwick County Society held at Wichita on December 4. He reported on the success of the "Kansas Plan" for interesting physicians in locations in small towns and rural communities.

Dr. Frank A. Moorhead, Neodesha, was named president of the Wilson County Society at a meeting

held at Neodesha recently. Dr. Lynn E. Beal, Fredonia, was chosen vice-president, and Dr. Charles E. Stevenson, Neodesha, was named secretary-treasurer.

A Christmas party for members of the Southeast Kansas Medical Society and their wives was held at the Hotel Besse, Pittsburg, on December 12. More than 100 persons attended. The program included a talk by Dr. Francis T. Collins, Topeka, president of Kansas Blue Shield, and music by students at Kansas State Teachers' College, Pittsburg.

Dr. Kenneth L. Graham was elected president of the Leavenworth County Society at a meeting held on December 10 at Leavenworth. He will be assisted during the year by Dr. Peter S. Combs, vice-president, and Dr. Carroll D. Voorhees, secretary-treasurer. All are Leavenworth physicians.

Dr. and Mrs. J. H. A. Peck, St. Francis, entertained members of the Northwest Kansas Medical Society and their wives at a hunting party and dinner at the Peck ranch near Parks, Nebraska, recently.

The Labette County Society announces the following officers for 1957: Dr. Howard V. Bair, president; Dr. Rolland W. Urie, vice-president; Dr. Richard E. Bartman, secretary-treasurer; Dr. Earl Martin, delegate to state convention, and Dr. Arthur Burgess, alternate. The meeting at which the election was held

DEATH NOTICES

JAMES HENRY DITTEMORE, M.D.

Dr. J. H. Dittmore, 82, an honorary member of the Republic County Medical Society, died at the Belleville Hospital on November 20. He had practiced in Kansas since 1901, having graduated from Rush Medical College, Chicago, in 1899. His first office was at Axtell, then at Cuba, and later at Belleville. He had been retired in recent years.

PETER FRANK THEIS, M.D.

A member of the Sedgwick County Medical Society, Dr. P. F. Theis, 71, was found dead at his home in Wichita on December 19, apparently the victim of a heart attack. A graduate of Ensworth Medical College, St. Joseph, Missouri, in 1907, Dr. Theis practiced at Arma for 24 years, then at Arkansas City for 15 years before moving to Wichita to practice there.

followed a dinner at the Parsonian Hotel with Dr. Burgess, retiring president of the group, as host.

Dr. Henry B. Stryker was elected president of the Cloud County Society at a meeting held at Concordia last month. Dr. Lindell C. Owensby was named vice-president, and Dr. Marion C. Pearson was chosen secretary-treasurer.

"Respiration in the Newborn" was the subject discussed by Dr. Ned W. Smull at a meeting of the Wyandotte County Society in Kansas City on December 18. "Clinically Significant Gastric Juice Components" was the title of a paper presented by Dr. Arthur P. Klotz. A business session followed.

The Montgomery County Society has voted to discontinue its approval of the present plan of operation with the Montgomery County Board of Social Welfare. Welfare patients will be billed directly in the future.

New officers of the Dickinson County Society were chosen at a meeting held at Chapman recently. Dr. Charles R. Svoboda, Chapman, was reelected president, Dr. James O. Gilliland, Herington, was named vice-president, and Dr. Dean C. Chaffee, Abilene, was chosen as secretary-treasurer. Dr. Daniel Petersen, Herington, addressed the group on the subject of Salk vaccine.

PHYSICIANS' ACTIVITIES

Dr. Orville S. Walters, who practiced in McPherson before beginning a residency in psychiatry in Topeka in 1953, has been assigned to the Veterans Administration Hospital in Danville, Illinois, for a two-year period. He is also an associate professor in psychology at the University of Illinois at Urbana.

Governor Fred Hall recently announced the appointment of **Dr. Louis S. Morgan, Jr.**, Wichita, as a member of the Hospital Advisory Council to the Kansas State Board of Health.

Dr. E. D. Peffly, formerly of Vinita, Oklahoma, has begun practice in Chetopa. He is occupying offices formerly used by **Dr. Robert A. Dobratz**, who recently moved to Beloit.

A feature story about **Dr. William Holwerda** was

published in recent issues of the *Lindsborg News-Record* and the *Salina Journal*. Dr. Holwerda has completed 25 years of practice in Lindsborg.

Dr. Bruno Minz, who until recently was director of research at the University of Paris, has been named director of research and education at the Osawatomie State Hospital.

Dr. R. A. Schwegler, Jr., and **Dr. R. L. Hermes**, Lawrence, announce that **Dr. Howard L. Wilcox** is now associated with them in practice. Dr. Wilcox, a graduate of Cornell University Medical School and a diplomate of the American Board of Obstetrics and Gynecology, formerly practiced in Boonville, Missouri.

A talk on cancer was given by **Dr. Dick B. McKee**, Pittsburg, before a recent meeting of the Crawford County Medical Assistants' Society.

Dr. Robert C. Polson, Great Bend, recently received the Silver Beaver award, the greatest honor that can be bestowed on an adult by the Boy Scouts of America on the council level. He has been working with the Boy Scout organization for 15 years.

Dr. Lyle G. Glenn, Protection, was named last month as a member of the Kansas State Board of Health. Governor Fred Hall appointed him to complete the unexpired term of **Dr. Richard E. Speirs**, Dodge City, who resigned.

The Mississippi Valley Medical Society announced recently the election of **Dr. William P. Callahan**, Wichita, as its vice-president from Kansas.

Dr. Peter K. Wiens, who had been practicing in Minneola, moved to Ness City last month and has opened an office there.

The Eddy Clinic, Hays, announces that **Dr. James H. Hickman** is now practicing on the clinic staff. A graduate of the University of Pennsylvania School of Medicine, Dr. Hickman served a three-year residency in internal medicine and two years in the United States Army. He is a diplomate of the American Board of Internal Medicine.

New officers of the Topeka Blood Bank are **Dr. Henry S. Blake**, president; **Dr. William O. Martin**, secretary, and **Dr. Robert E. Pfuete**, treasurer. Other board members are **Dr. A. A. Fink**, **Dr.**

Charles S. Joss, Dr. W. H. Crouch, and Dr. Robert H. O'Neil.

Dr. Frederick P. Wolff, Pratt, was guest speaker at a meeting of the Woman's Auxiliary to the Pratt County Medical Society recently. He discussed poliomyelitis and tuberculosis.

Dr. Francis J. Nash, Kansas City, served as chairman of 1956 Christmas Seal sales for Wyandotte County.

A feature story about **Dr. Robert A. Reinhardt**, who has practiced in Glen Elder for 43 years, was published in an issue of the *Beloit Call* last month.

A talk on child psychiatry was given by **Dr. Edward D. Greenwood**, Topeka, at a recent program sponsored by the Riley County Association for Mental Health.

Dr. Lindell C. Owensby, Concordia, recently became a fellow of the American Academy of Ophthalmology and Otolaryngology.

The Kansas State Board of Social Welfare has announced the appointment of **Dr. Frank V. Smith, Jr.**, formerly on the staff of Topeka State Hospital, as assistant director of institutions for the state. He began the new work on December 1.

Dr. Ralph H. Major, professor emeritus of medicine and the history of medicine at the University of Kansas School of Medicine, returned recently from a trip around the world. He was a visiting professor of medicine at the University of Manila for one semester during the trip, and he lectured at the International Congress of the History of Medicine when he was in Madrid.

Dr. Marvin M. Somers, Wichita, recently became a diplomate of the American Board of Radiology.

Dr. Katherine Pennington, Wichita, has successfully completed the examinations of the American Board of Pediatrics and is now a diplomate of that board.

One thousand five hundred seventy-three women were studying medicine in the 76 approved four-year medical schools in the United States during the 1955-1956 academic year, according to a recent report from the American Medical Association.

Insurance Agent Retires

Mr. J. E. McCurdy, general agent for the Medical Protective Company of Fort Wayne, Indiana, for the past 32 years, announced his retirement recently and moved to Mountain Home, Arkansas. He had served the profession in Kansas since 1938. His son, Mr. Robert E. McCurdy, has succeeded him with the insurance company.

Stipend Increases

Stipends for fellows of the National Science Foundation and the United States Public Health Service will be increased for all receiving awards after January 1, 1957, according to a recent release from the Department of Health, Education, and Welfare. At the postdoctoral level the stipend for the first year will be \$3,800, for the second year \$4,200, and for the third year, \$4,600. Allowances, including tuition, certain travel expenses, and \$350 for each dependent, remain unchanged.

Research Grant to Kansas

A research training grant of \$38,802 to the University of Kansas was one of a number totaling \$819,067 announced recently by the Department of Health, Education, and Welfare. The grants are part of a \$1,200,000 program established by the National Cancer Institute to increase scientific manpower for clinical and non-clinical cancer research.

The program extends and supplements research training opportunities available through regular research fellowships and through employment on research projects, but it does not replace them. Institutions receiving funds may select individuals to be trained and determine the stipends they are to be paid.

Causes of Death

Next to heart disease, cancer is the most frequent cause of death in the majority of highly developed countries, according to a recent release from the World Health Organization. Highest on the list of cancer deaths, from 39 to 73 per cent of the total, are those caused by cancer of the digestive organs.

Mortality from cancer of the digestive organs is higher in men than in women. Stomach cancer is responsible for the majority of cancer deaths in both sexes, immediately followed by cancer of the large intestine and the rectum. The W.H.O. study also shows that mortality from these malignant neoplasms increases from the age of 40 onward and becomes more important after 60.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

A new venture in federal medical care—the armed forces dependents medical care program—was launched on schedule December 7, and two million dependents of servicemen became eligible for hospitalization and extensive medical care.

The "medicare" program, because it is a pioneer effort, will be watched closely by members of Congress, the armed services, and the medical profession. Congress will be interested in keeping track of the cost of the program as well as the availability of care.

The Defense Department has earmarked \$41 million for the program through next July 1. Thereafter it is estimated the cost will run between \$60 million and \$70 million a year. When the program is operating at its peak, as many as 800,000 dependents not now getting care at U. S. expense are expected to be participating.

In all but a few states, provision of medical care outside military facilities is being made under agreements signed between the state medical societies' contracting agent (generally Blue Shield) and the Army which is the executive agent for Defense.

The contracts run for seven months, and all states are expected to renegotiate contracts prior to their expiration next July 1. New contracts naturally would reflect the experience gained since December 7.

As the vast new project went into force, the newly created Office of Dependents Medical Care (ODMC) stressed that the law intended that civilian medical care under the program should be comparable to that provided in armed services facilities. Participating physicians receive payment in full from the government under a published schedule of allowances. ODMC said this means that the doctor will receive payment for his usual charge or the amount set in the schedule, whichever is less.

ODMC made these additional points:

1. In instances in which the physician believes that an allowance greater than that prescribed in the local schedule is justified, he should look to the government rather than the patient for payment. Provisions have been made for him to submit a special report to his state medical society and, the society, in turn, to the government.

2. Military dependents may submit as identification their post exchange card, the combined post ex-

change-commissary-military medical care card, or the standard military dependent identification card. A special medicare card is being prepared and after next July 1 will be the only identification allowed for this purpose.

3. There are no plans in Defense for authorizing payments for drugs, medicinals, or other medical supplies, except those furnished while hospitalized or those administered directly by a physician.

4. The claim form to be used by physicians in the medicare program is called "Statement of Services Provided by Civilian Medical Sources." ODMC said sufficient supplies have been furnished by all state agents.

5. The law and implementing regulations do not permit payment for any medical care, services, or hospitalization prior to December 7; this includes prenatal care.

The broad outline of legislative proposals to come from the administration in the newly convened 85th Congress was first sketched by HEW Secretary Folsom in several appearances before newsmen in December. Among them are: (1) federal grants to medical schools for teaching facilities, (2) authorization for smaller insurance companies to pool resources without violating the anti-trust laws in an effort to encourage expansion of voluntary health insurance, (3) increased attention to problems of older persons, particularly in health and adult education, (4) continued expansion and improvement in vocational rehabilitation, and (5) expansion of staff and facilities of the Food and Drug Administration.

Following up President Eisenhower's plea for increased utilization of backed up stocks of Salk poliomyelitis vaccine, Secretary Folsom told a National Press Club audience: "... we have a new danger—the danger of public apathy. It is ironic that in the face of such a dread disease, larger quantities of the vaccine are not being used." The President has urged that the vaccine be given additional groups, including young adults.

A "package" bill combining both basic and major medical expense insurance is being worked on by the Government for its civilian employees. . . . A special advisory committee headed by Dr. Russell Nelson of Johns Hopkins Hospital has asked hospitals to set up pilot projects to see how to revise care given long-term patients in hospitals, and also cut costs. . . . The national illness and disability survey voted by the last Congress will be supervised by Forrest E. Linder, Ph.D., former head of social statistics for the United Nations.

Systemic Lupus Erythematosus

*Review of the Literature and Presentation of 11 Cases**

W. W. WOODWARD, M.D., *Indianapolis*

Systemic lupus has received, in the last few years, a greatly increased amount of study and attention. As a result of earlier recognition of systemic lupus, concepts of the clinical course of the disease, as well as the diagnostic criteria, are subject to scrutiny and revision. This paper will attempt to treat the history of the disease, observations on its nature, clinical manifestations, and its course and prognosis. Eleven cases of systemic lupus within the scope of the revised diagnostic criteria will be reported.

The study of systemic lupus was initiated by Biett⁹ in 1828, who described the skin lesion as "erythema centrifugue." Kaposi²² differentiated between discoid and disseminated lupus under those names in 1872. He described the latter as characterized by fever, toxicity, and skin lesions. The systemic ramifications were first described clearly by Osler in 1895.²⁸ His remarkable observations are clearly summarized in the following quotation: "By exudative erythema is understood a disease of unknown etiology with polymorphic skin lesions, hyperemia, oedema, and hemorrhage, with arthritis occasionally, and a variable number of visceral manifestations, of which the most important are gastrointestinal crises, endocarditis, pericarditis, nephritis, and hemorrhage from mucous surfaces."

Osler also described cases which ran their course to death without ever showing involvement of the skin—an observation which was not generally appreciated for many years.

The LE Phenomenon

The greatest impetus given the study of systemic lupus was supplied by Hargraves in 1948, who was the first to report the finding of the now well known "LE" cell in bone marrow.¹⁸ It will be useful at this time to review the literature attendant to this phenomenon to aid in developing the diagnostic criteria used in the 11 cases to be presented later.

Soon after the original discovery of the LE cell

there arose much speculation as to its specificity. In his original article Hargraves made the guarded statement that these cells had not as yet been observed in any other disease state. This statement did not go unchallenged long, and in 1950 Berman⁸ reported a series of observations which continue to exert a disproportionate influence in assessing the reliability of the LE phenomenon as a diagnostic procedure. He reported five false positive observations, which occurred in patients with the clinical diagnoses of pernicious anemia, dermatitis herpetiformis, chronic discoid lupus, and "collagen disease of unknown type." No clinical information was reported with this presentation.

Lee²⁵ reported, along with a procedure for performing the test, a false positive occurring in a patient with hemolytic anemia. It is scarcely necessary to point out that without clinical data it is difficult to evaluate these reports. On the other hand, evidence for specificity is impressive.

Early support was given by Barnes and his colleagues in 1950.⁵ He found that patients with systemic lupus gave positive tests, those with discoid lupus gave negative, other collagen diseases also giving negative results. These investigators established the fact that the phenomenon was dependent on an LE factor in the patients' serum and occurred in the absence of anticoagulants. Many investigators have since reported their belief that the LE test is indeed a specific one.^{5, 18, 23, 35} Among the most impressive series of cases illustrating specificity of the phenomenon is that reported by Harvey and colleagues¹⁹ in presenting some 700 cases in which negative results were encountered. These cases included examples of all other collagen diseases, acute infectious processes, glomerulonephritis, multiple myeloma, and many others.

It is perhaps correct to say that most current opinion reflects the thought that if rigid criteria of identification are used in establishing a positive test, the occurrence of the LE phenomenon is indeed specific. Closely allied with a discussion of these criteria is some consideration of the methods of testing employed, the nature of the LE phenomenon, and the frequency with which positive results are encountered in those patients with systemic lupus erythematosus.

*The author is indebted to Dr. M. G. Berry from whose files the cases presented in this paper were obtained.

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Woodward is now serving his internship at the Methodist Hospital of Indiana, Indianapolis.

The LE cell is a mature polymorphonuclear leucocyte containing a homogenous mass of material which stains a reddish-purple with Wright's stain. This mass of material enlarges the neutrophile somewhat, it being several times the diameter of an erythrocyte in smeared preparations. In identifying cells as LE cells it is necessary to bear in mind that the chief points of confusion—tart cells and abnormal basophiles—may be avoided if one is careful to make such an identification only in the presence of a perfectly uniform homogenous inclusion body. These inclusion bodies have long been considered to be of nuclear origin.¹⁸ This belief is based on various factors, among them the Fuelgen positive staining reaction, and some studies reporting the observation of polymorphonuclear cells ingesting nuclear material of undetermined source.¹⁹

Consideration of the immunologic and biochemical factors thought to be responsible for the formation of the LE cell is largely beyond the scope of this paper. As originally observed,¹⁸ the cells were seen in bone marrow treated with heparin, and the phenomenon was thought to occur *in vivo*. Subsequently it was found that the cells were formed in suspensions of the patients' serum and cells, *in vitro*, and regardless of the presence or absence of anticoagulants.

There is general agreement that three factors are necessary for the production of LE cells. These are: (1) the LE factor from the patient's serum; (2) a source of nuclear material, and (3) viable polymorphonuclear leucocytes. The LE factor has been found to be an antigenic gamma globulin and has been shown capable of producing antibodies in several species of animals.^{4, 5, 8, 19} Many variations in the actual mechanics of performing the test are possible, all of which are capable of demonstrating the cells. Hargraves⁴ recently reported that those systems which embody the use of the patient's clotted blood yield consistently higher counts of LE cells than other procedures. His test was performed on the patients reported in this paper.

In those patients with lupus, LE cells are found with varying frequency. Harvey¹⁹ found an incidence of 84 per cent in his 138 cases. Dubois found positive tests in but 56 per cent of his 70 cases. Reports run as high as 100 per cent in one series.²⁵ Typically the occurrence is intermittent in the same patient during the course of his disease. In some the cells were demonstrated after as many as 12 negative tests, and in one patient reported by Harvey¹⁹ only two of 18 tests performed during a prolonged course of active disease were positive. It is generally stated that the number of LE cells is poorly, if at all, correlated with the state of the disease, although Ross and

Wells³⁷ have routinely found fewer cells when the disease is in a relative remission.

We may summarize this aspect of the discussion as follows:

1. The LE test, if properly performed and evaluated, is a reliable diagnostic tool.
2. One cannot use the quantitative count as a prognostic aid.
3. In cases of well defined lupus erythematosus, repeated negative results have been encountered, thus indicating that negative results have no value if the clinical diagnosis is compatible with systemic lupus erythematosus.

Disease Processes and Etiology

The observations of Osler, cited above, are the more remarkable when it is considered that he wrote without the advantage of autopsy studies. Little was written about the pathology of systemic lupus until the report of Libman and Sacks,²⁶ who were the first to equate the finding of an atypical verrucous endocarditis with a systemic disease. These patients had a clinical disease characterized by various cardiac symptoms, albuminuria, and arthralgia. At autopsy the now well recognized findings of verrucous endocarditis not associated with positive blood cultures or typical inflammatory findings were reported, along with the finding of glomerular alteration and perivascular inflammation.

Scarcely more can be reported concerning the specific pathological lesions of the disease to this day. Early in the study of the disease the basic lesion was noted to be one of degeneration rather than inflammation. Klemperer and his associates²³ were among the first to describe the process as one which typically involved the ground substance or collagen of the body, thereby giving rise to the distinctive picture of fibrinoid degeneration. This basic process occurs in many disease states—the distinguishing factor being the systemic distribution of the lesion.

The only completely characteristic lesions of lupus are two in number—the so-called wire loop glomerular involvement, and the previously described Libman-Sacks endocarditis. The renal lesions are of two types. The most common, but not specific, is an endothelial proliferation of the glomerular capillaries, with eventual occlusion of the vessels. The second lesion, thought to be pathognomonic, is the "wire loop" change, which consists of an irregularly thickened eosinophilic basement membrane.¹⁹ Tubular lesions, as pointed out by Baggenstoss,⁴ do not appear until extensive glomerular change is apparent. The question of renal failure seems to be predicated simply on the number of involved glomeruli.

It was noted early that the lesions found in a group

of diseases with more or less distinctive clinical characteristics were similar. Klemperer²³ and Aegerter¹ were among early investigators who began to group the clinical entities of rheumatic fever, periarteritis nodosa, diffuse scleroderma, serum sickness, thromboangiitis obliterans, and systemic lupus under the heading of collagen diseases. This grouping was based on the recognition that the lesions in the various diseases were in the tissues of mesenchymal origin.³ Basic in the development of this theory is the fact that the mesenchymal tissues form the framework of all tissue. Regardless of the degree of modification or differentiation encountered in the specific tissue under consideration, the mesenchyme is capable of reacting to various stimuli in only a few basic ways. These reactions are degeneration, fibrosis, and cellular reaction, making up the well known "fibrinoid" type of degenerative collagen reaction. This histological reaction is not specific and may be observed in any of the group of diseases mentioned above.

Ehrlich¹⁴ is of the opinion that the common denominator of the group is their pathogenesis. Recognizing that collagen is made up of mucopolysaccharides and proteins, he states that injury to this tissue results in a rise of these substances in the blood, most prominent being the rise of serum gamma globulin. He considers that these diseases result in the production of abnormal gamma globulins, apparently created by plasma cells, which are responsible for the non-specific injury to the general mesenchyme. He feels that this group is more appropriately called dysgammaglobulinemias, or systemic diseases of connective tissue.

The attempt to correlate the various types of collagen disease with a common etiologic factor has not as yet been fruitful. Aegerter and Long¹ early postulated that the tissues of mesenchymal origin play an important if non-specific role in defense as well as reparative processes, and that disturbances in the evoked response may lead to tissue damage. This theory qualifies as a corollary to the well studied and documented tissue damage elicited in such immunologic phenomena as the Arthus reaction and the anaphylactoid response to various protein antigens. The latter are examples of easily reproduced disorders of reaction and may well be a factor in the pathogenesis of collagen disease in general.¹⁵ Many workers, among them Aegerter and Long,¹ have produced, by induced hypersensitivity, lesions of the mesenchyme which bear some resemblance to those encountered in the clinical diseases of this group. The reactions lead to generalized necrosis and fibrosis of collagen, but no lesions which are unequivocally identical with those found at autopsy in this group have been encountered.

The similarities of the collagen diseases do not end with the microscopic picture. In all there is to be encountered some degree of hyperglobulinemia, lymphadenopathy, elevated sedimentation rate, and fever. In many, alterations occur in such measures of abnormal protein levels as the thymol turbidity test. Some investigators feel that the collagen diseases are essentially the same disease with various clinical manifestations. Shaffer and his colleagues³⁸ expressed such an argument in presenting three cases of systemic lupus which came to autopsy. In the report an attempt was made to equate the collagen diseases with each other, chiefly on the basis of the dermatologic picture. In the comparison of skin lesions encountered in various of the collagen diseases, obvious similarities were found. Unfortunately the clinical data presented is scanty—there is no mention of LE tests performed on these patients, and only one of three who came to autopsy had typical glomerular lesions, while none had endocarditis.

Many reports of presumed etiologic or precipitating factors are to be found in the literature. Many of these deal with reactions to various drugs. Among agents reported in this connection, the antibiotics and sulfonamides are commonly incriminated. Two representative examples of such reports are those by Paull³¹ and Gold.¹⁷

The latter article presented eight patients with a history of photosensitivity, dermatitis, and fever, in whom the administration of sulfonamides and penicillin produced the full clinical picture of systemic lupus, with two patients rapidly succumbing to the exacerbation of the disease. Although the diagnosis of lupus had not been made prior to the administration of the drugs, two patients had chronic discoid lupus and three others had histories compatible with the diagnosis of mild clinical lupus.

Paull³¹ reported a patient who, in the course of being treated for pulmonary disease and cor pulmonale, was given penicillin and subsequently had unequivocal systemic lupus. In this case no history of antecedent illness is given, so the possible existence of the disease prior to therapy cannot be determined.

Harvey¹⁹ believes that such examples of lupus related in onset to drug therapy are probably examples of trigger mechanisms of underlying processes, rather than a direct causative factor in their pathogenesis. Duston and colleagues¹² reported a series of 13 patients with hypertension being treated with hydralazine in whom a disease characterized by polyserositis, arthritis, and fever developed. The clinical picture was indistinguishable from systemic lupus with the following exceptions: (1) the incidence in men was in a 4:1 ratio; (2) there was no proteinuria or cylindruria at any time; (3) only one had LE

cells, and (4) all but one patient had prompt remission without sequelae upon discontinuance of the drug.

The foregoing sections would indicate that the factor played in the production of the collagen diseases, by altered reactivity, at least as far as lupus is concerned, is in question. There is, however, evidence that such factors are present.¹⁵ One of the interesting findings encountered in the study of systemic lupus has been the high incidence of biologically false positive serologic tests for syphilis. There are several diseases in which such reactions are encountered in the acute phase, and a few in which they are encountered while disease is chronic. Systemic lupus lies within both groups. Such a reaction indicates some change in the immunological mechanisms in patients with lupus.

Moore²⁰ makes the statement that these reactions are encountered in approximately 20 per cent of patients with systemic lupus. He found that a substance analogous with reagin was encountered in the serum of these patients. Once again arises the question of whether this represents, as an altered reactivity, a hint toward an allergic pathogenesis of the disease or whether it is simply a manifestation of the widespread involvement. There is some evidence to indicate that altered immunologic response may antedate other manifestations of lupus by considerable periods of time.

Haserick and Long²⁰ presented five cases of lupus diagnosed from one to seven years after the first false positive test for syphilis was obtained. In none of these patients could the diagnosis of lupus have been made clinically at this time. One had had some degree of arthritis and fever, the other no symptoms compatible with the diagnosis. Harvey¹⁹ suggests that these patients and those with clinical lupus represent opposite poles of an identical disease spectrum—that those who manifest only the false positive reactions may either develop typical lupus, continue with mild sub-clinical forms, or subside completely.

Other precipitating factors have been investigated, and for the most part their role is undetermined. Sensitivity to sunlight constitutes both a symptom of the disease and a factor commonly found in acute episodes. Harvey and colleagues¹⁹ report that among their cases were four in whom the initial symptoms of lupus occurred during pregnancy. No attempt is made to postulate a why or wherefore. Baggenstoss⁴ states without amplification that lupus may be aggravated during gestation. One of the patients reported in this paper had initial symptoms within a few weeks after delivery of her second child. Such relationships are obviously open to question, as the peak of incidence of the disease is in women within

the childbearing age. No evidence has been demonstrated which enables the observer to state without equivocation that the pathogenesis has been determined.

Diagnosis and Course

We will now turn to consideration of the diagnosis and clinical course. In few other clinical entities may the picture presented by this disease be matched for its variability. The concept of the disease itself has undergone considerable revision in the past years, with more emphasis being placed on the many ramifications of its involvement. As pointed out by Arnold² the dermatologic phenomena were considered to be the chief manifestations as well as the major diagnostic finding for many years. In stressing the widespread involvement encountered, Arnold was the first to propose the title of systemic lupus erythematosus. Other evidence of the changing emphasis may be found in proposed revision of the name, e.g. "malignant lupoerythematosvisceritis," a highly descriptive if cumbersome title.

The protean nature of the signs and symptoms of systemic lupus is readily understood from the previous discussion, which was intended to reveal the disease as one of mesenchymal dysfunction rather than one which involved discrete organ systems. Tumulty⁴⁰ makes the statement that the only typical feature, diagnostically, is its very lack of typicality. He includes a list of erroneous diagnoses recorded on patients at John Hopkins Hospital who were later shown to have systemic lupus (Table I).

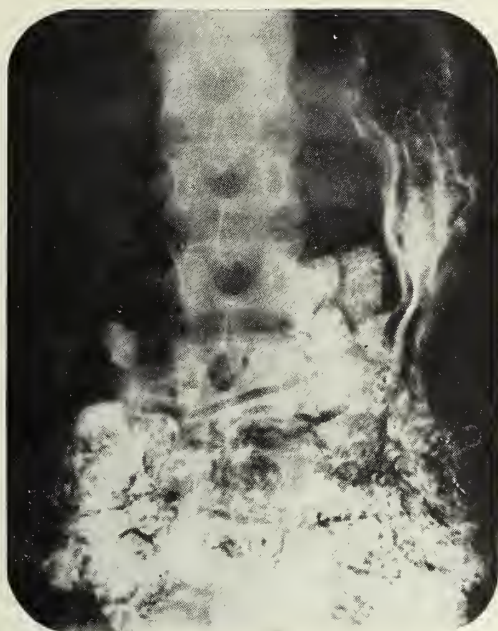
TABLE I
PRIMARY DIAGNOSIS ON PATIENTS WITH
SYSTEMIC LUPUS ERYTHEMATOSUS

| | |
|------------------------------------|---------------------------------|
| 1. Subacute bacterial endocarditis | 12. Idiopathic thrombocytopenia |
| 2. Rheumatic fever | 13. Anemias of various types |
| 3. Various skin disorders | 14. Primary leucopenia |
| 4. Latent syphilis | 15. Virus pneumonia |
| 5. Raynaud's disease | 16. Septicemia |
| 6. Fever of undetermined origin | 17. Dermatomyositis |
| 7. Glomerulonephritis | 18. Lymphoma |
| 8. Epilepsy | 19. Scleroderma |
| 9. Psychosis | 20. Tuberculosis |
| 10. Drug reaction | 21. Brucellosis |
| 11. Functional illness | |

The patients in the report will be presented in terms of occurrence of signs and symptoms in specific organ systems. This is for the sake of orderly discussion, and with an awareness of at least two major faults in such a presentation. The first of the faults

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may be illustrated by two patients who are seen with pericarditis and pleuritis, respectively. Although the signs and symptoms differ, the basic difficulty is polyserositis, and the two may well exchange clinical pictures in the course of their diseases. The second fault lies in the fact that such a discussion must be conducted in terms of findings in the course of the illness over a period of time, and as the findings may be of a transient nature, or are discovered incidentally, they bear varying relationship to the overall clinical picture and to the presenting symptoms. These objections will be compensated to some extent by Tables II and III, which present respectively the presenting symptoms encountered and the summary of the signs and symptoms seen in these patients thus far.

These patients were seen in private practice in a four-year period and represent approximately .3 per cent of new patients seen during this time. Few figures of relative incidence of this disease can be found in the literature. Dubois⁹ states that the diagnosis is established with nearly the same frequency at the University of Southern California as is the diagnosis of classic pernicious anemia. In all of these cases except No. 6, positive LE cell preparations have been observed in the office laboratory and by a competent hospital pathology staff.

GENERAL

Presentation of Cases

Case 1. O. G., a 45-year-old white woman, was first seen in February, 1954. Her chief complaint was "bloating after meals," of approximately three years' duration. She was a highly nervous hyperemotional woman. It was stated by her family that she had become so over the period of the last several years, although no definite time of change could be identified. Past and family history was essentially negative. Review of systems revealed that the patient suffered from frequent severe headache, often accompanied by

dizziness. She also complained of mild blurring of vision. There was no nausea or vomiting. The headache was bilateral. A history of palpitation of three years' duration was obtained.

Physical examination revealed an anxious, slightly overweight, chronically ill appearing woman in no acute distress. The only positive physical finding was a grade 3 systolic murmur at the apex. Laboratory work was within normal limits. The diagnosis at this time was old rheumatic heart disease, inactive; aerophagia; and hyperventilation syndrome.

The patient was not seen again until April, 1955. Complaints at this time consisted of polyarthritides, more pronounced and frequent dizziness, and non-specific gastrointestinal distress. Physical examination revealed minimal evidence of arthritis as manifested by metacarpal-phalangeal swelling, and the heart murmur noted before. At this time a low grade fever without obvious cause was observed. Many LE cells were seen in a smear. The patient was placed on heavy salicylate therapy following a course of corti-

TABLE III
RELATIVE OCCURRENCE OF SIGNS AND SYMPTOMS
BY PATIENTS

| Case Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Per Cent |
|-------------------------------|---|---|---|---|---|---|---|---|---|----|----|----------|
| Fever | X | X | X | X | X | X | X | X | X | X | X | 100 |
| Fatigue | | X | | X | X | X | X | X | X | X | X | 81 |
| Nervousness | X | | | X | | | | | | | X | 27 |
| Arthritis | X | | X | | X | | X | X | X | | X | 64 |
| Pericarditis | X | | | | | | X | X | X | | | 36 |
| G.I. Disorders | X | | | | X | | | X | | X | X | 55 |
| Skin Rash | | X | X | | X | | X | X | X | | | 55 |
| Albuminuria | | | | | X | X | X | X | | | X | 45 |
| Pleural Effusion Pleuritis | | | | | | X | X | X | | | | 27 |
| Neuritis | | | | | | | X | X | | | X | 27 |
| Ecchymoses Petechiae | | | | | X | | | X | | | | 18 |
| Cardiac Manifestations* | X | | | | | | X | X | | | | 27 |
| Tachycardia Palpitation | X | | | | | | | | X | | | 18 |
| Fainting Dizziness | | | X | | | | X | | | | X | 27 |
| Palpable Liver | | | X | | | X | | X | | | | 27 |
| Palpable Spleen | | | X | | | X | | | | | | 18 |

* Denotes failure or significant murmurs

TABLE II
PRESENTING SYMPTOMS OF PATIENTS

| | |
|----------|---------------------------|
| Case 1. | Abdominal bloating |
| Case 2. | Fatigue |
| Case 3. | Dizziness |
| Case 4. | Menorrhagia |
| Case 5. | Polyarthralgia |
| Case 6. | Pleuritic pain |
| Case 7. | Fainting and convulsions |
| Case 8. | Bloating and facial edema |
| Case 9. | Substernal pain |
| Case 10. | Abdominal distress |
| Case 11. | Headache and dizziness |

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sone and was discharged. When last seen in July, 1955, she was somewhat improved subjectively. Routine electrocardiogram at this time showed evidence of pericarditis, and an enlarged cardiac shadow was noted. The patient was again treated with cortisone and discharged as improved.

Case 2. A. B., a 57-year-old white woman, was first seen in November of 1954. Chief complaint was fatigue, noted for seven or eight months, and of nearly incapacitating severity in the last two or three months. Past history and review of systems was negative. Positive physical findings were limited to an indurated macular skin rash over the arms and hands and a tachycardia of 106. Routine laboratory work, including serology, was negative. Electrocardiograms, chest roentgenograms, basal metabolic rate, and cholesterol studies were within normal limits. During a course of observation the patient manifested a fever of unknown origin on several occasions. LE tests were performed, and repeated positive results were obtained. The patient was not seen again after the original period, but correspondence indicates that extreme fatigue persists as the sole symptom at this time.

Under the heading of general findings we may group those manifestations of a largely subjective nature and fever. As may be seen from reference to Table III, complaints of fatigue and nervousness are prominent in these patients. These were recorded when so severe as to be nearly incapacitating. No specific explanation is offered for the occurrence of these general constitutional symptoms in this group. Fever was present in all of these patients at some time during the course of observation. Fatigue was a prominent symptom in seven, nervousness in three. No clear cut personality changes were observed at any time in the latter, and it is difficult to determine when in the course of the disease this symptom became apparent. Little mention is made in the literature of the subjective symptomatology of systemic lupus. Fever, as in these patients, was a nearly universal finding in the series of most observers. Reported incidences range from 86 to 100 per cent in the large series reported by various authors.¹⁹ The fever as observed in our patients was usually of the low grade persistent type. At no time was a high spiking fever seen in this group.

Nervous system signs in lupus erythematosus were not well documented or recognized until recent years. Jessar²¹ has published some of the more frequently observed neurological signs of lupus. In his series some nine per cent had convulsions, five per cent a "toxic psychosis," and two per cent had hemiplegia. It has been pointed out by Dubois¹² that multiple central nervous system symptoms may occur, predicated on cerebral angiitis.

NERVOUS SYSTEM

Case 3. A. S., a 16-year-old white man, was first seen in March, 1954. Chief complaint at this time was dizziness of two months' duration. Past history and review of systems were non-contributory. The episodes were moderately severe, had a variable duration in minutes, and were not associated with convulsions or fainting. There was some headache at these times. Laboratory work was within normal limits. Physical examination revealed a blood pressure of 165/90. The liver was palpable two fingerbreadths below the right costal margin, the spleen was palpable one fingerbreadth. One week later LE tests were performed, and positive results were obtained. One month after the original visit a typical butterfly rash was observed, and the patient was complaining of arthralgia of the hands. Four months later the spleen was no longer palpable, only the liver edge was felt, and the dermatitis was gone. At this time a cervical adenopathy not previously observed was noted. When last seen the patient had remained asymptomatic for several months.

Peripheral neuritis has been reported with somewhat less frequency than central nervous system involvement, but it is a well recognized finding. Sedgwick³⁶ reported five cases of the disease in which the neurologic involvement included toxic psychoses, multiple peripheral neuritis, hemiplegia, focal paralyses, and chorea. Seikart³⁷ reported five cases of lupus with neurological presenting complaints. They included hemiplegia, dysarthric speech, paresis, numbness and tingling of extremities, vertigo, and other symptoms. Persky³² reported five patients with lupus in whom the presenting sign was petit mal. In the latter two groups the signs and symptoms mentioned antedated the development of the classic lupus by periods of months to years. In so far as is known, the development of these signs is due to either circulatory insufficiency or to azotemia secondary to the common renal involvement. Other articles largely confirm the multiplicity of these neurological findings.¹¹

IMMUNOLOGIC AND HEMOPOIETIC SYSTEMS

Case 4. M. S., a white woman, was seen at the age of 20 with the presenting complaint of menorrhagia of five years duration. In the course of clinical work-up a history of extreme nervousness was elicited. Other past history and the review of systems were non-contributory. Physical examination revealed a thin, agitated white female in no acute distress. A fine hand tremor was present, along with a slightly enlarged smooth thyroid, and the skin was moist and cool. No further positive findings were present.

All laboratory work was within normal limits.

Basal metabolic rate was 0, and iodine uptake was normal. In spite of the latter findings the clinical impression was one of mild hyperthyroidism, and the patient was placed on Itrumil. During the next three months the symptoms of fatigue and nervousness persisted, with some slight malaise. In the course of a work-up by a gynecologist at this time a positive Kahn and VDRL were discovered. These had been negative three months earlier, and there was virtual certainty of a lack of possible contact. At this time there were no other new laboratory or physical findings.

LE tests were performed and were positive. The serology reverted to non-reactive in two months, then was again positive in October, 1955. Repeated positive LE tests have been encountered during this time. This patient is remarkable for the lack of either objective or severe subjective findings in the presence of two years of known disease.

Case 5. B. D., a 27-year-old white woman, was first seen in 1952. Presenting complaints at this time were polyarthralgia, skin rash, and cervical adenopathy. Past history revealed that the onset of difficulties had occurred two years before. At this time the patient was treated with Aureomycin for pyelitis. Following treatment the patient had the onset of vomiting and severe back pain. In spite of this reaction the patient again received the drug a year later. She had further vomiting and a generalized aching feeling. This was followed by two protracted courses of vomiting. Within a few weeks she began to complain of stiffness of the fingers, rapidly followed by pain in the feet. This persisted for one year, with intermittent bouts of cervical, axillary, and inguinal adenopathy. Review of systems revealed only a history of recurrent tonsillitis.

Physical examination revealed a palpable liver and spleen, cervical and axillary adenopathy, and a maculo-papular rash over the hands. Laboratory work showed a sedimentation rate of 10 mm./hour, two-plus albuminuria, and a positive LE test. She was placed on cortisone therapy and, after a fall associated with minimal trauma, developed ecchymoses of the left leg and hemarthrosis of the left knee. This was followed by an elevation of the sedimentation rate, high fever, and thrombophlebitis. Again, a remission was effected with cortisone. Eight months following this the patient had another episode of vomiting, fever, and exacerbated skin rash. The platelet count was not reduced at any time. The patient when last seen, four years following the onset of symptoms, was again symptom free, except for some residual arthralgia.

The most frequently noted hematologic sign of lupus is that of anemia, which may be fairly severe. This has been reported with varying frequency, rang-

ing from 34 to 70 per cent. The anemia is usually a normocytic, normochromic one of moderate degree. It is usually not associated with erythroid hyperplasia of the marrow, reticulocytosis, or jaundice, and therefore it does not seem to be associated with hemolysis of any degree.¹⁹ It is well known, however, that hemolytic anemias are sometimes seen in the course of the disease and have been reported in some 5 per cent of all cases.^{7, 19} In these cases, some of which displayed the anemia before other signs of lupus, diagnoses of acquired hemolytic anemia have been made and the patients have been subjected to splenectomy, which was without benefit. Purpura has frequently been reported in the course of systemic lupus. This purpura is of vascular, thrombocytopenic, and azotemic origin. Most of the cases seem to be of the non-thrombocytopenic forms, although there are several reports of genuine depression of the platelet count.

Rich,³⁴ in reviewing cases of "idiopathic thrombocytopenia" at Johns Hopkins Hospital, found definite evidence of lupus in six patients, two of whom were shown to have the disease at autopsy. McMeacham²⁷ reported three patients with lupus in whom a primary diagnosis of idiopathic thrombocytopenic purpura was established and who were subjected to splenectomy.

Examination of leucocytes may show one or both of two variations; either a moderate leucopenia, or, less frequently, an eosinophilia. In one of the patients to be reported (Case 6), both of these manifestations were transiently present. In all cases a good remission has been obtained in the above hematologic signs under cortisone therapy.

RESPIRATORY SYSTEM

Case 6. J. B., a 23-year-old white man, was first seen in April, 1955. Chief complaint at this time was chest pain and fatigue. History revealed that the patient had had a hemolytic episode four months before, with jaundice, an icteric index of 22, and a hepatogram compatible with hemolytic anemia. At this same time the patient noticed the onset of a dull, generalized headache and tinnitus. A history of shortness of breath, exertional dyspnea, right pleural pain, and slight hemoptysis was elicited. The patient had been noted to have white cell counts of 2,000 on two occasions.

Examination revealed only a palpable liver and spleen. Laboratory work showed a sedimentation rate of 14 mm./hour, hemoglobin of 90 per cent. Differential count showed 20 per cent eosinophiles. The Kahn test was negative. During observation a low grade temperature was noted, along with intermittent pleuritic friction rub and pain. Fatigue became a prominent symptom.

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One month later the eosinophilia had disappeared, and the spleen was no longer palpable. During the next three months exacerbations of fatigue, with a slight rise of eosinophiles and return of a barely palpable spleen, were noted on three occasions. When last seen the patient was asymptomatic. In this case five LE tests to date have failed to reveal LE cells. Diagnosis was established tentatively on the basis of the above findings.

The respiratory system is involved in lupus in two ways—pleural involvement commonly and intrinsic lung involvement less frequently.

In this series of cases pleural effusion and/or pleuritis was noted in three patients, Cases 6, 7, and 8. We did not observe parenchymal lesions in this group. Baggenstoss⁴ described the pneumonia of lupus and stated that the picture is one of alveolar hemorrhage, edema, and atelectasis. The frequency of this finding is not known. Harvey and his associates reported the finding in 40 per cent of their patients during the course of their disease. Pleural effusion or pleuritis is much more frequently noted than is pneumonia. It is reported in from 30 to 60 per cent of all cases. Noted with almost equal frequency is the occurrence of dry pleurisy with a friction rub and pain, sometimes of severe nature. Rarely the respiratory involvement may be so extensive as to be the major sign of disease, and if the alveolar changes are sufficiently widespread cyanosis may develop.

CARDIOVASCULAR

Case 7. G. T., a 45-year-old white woman, was first seen in 1954. Chief complaints at this time were fainting spells, convulsions, and dizziness of four years' duration. These episodes were sudden in onset and produced complete unconsciousness, and the patient was amnesic for the period of time involved. A diagnosis of grand mal epilepsy had been established.

Past history was non-contributory. Review of systems revealed angina pectoris orthopnea and dyspnea, frequent cough, and dependent edema of one year's duration. There was a history of polyarthritides of four years' duration and a severe episode of pneumonia 15 months before she was first seen. A temperature of 99.4 was noted.

Examination showed bilateral dullness to percussion with increased vocal fremitus and diminished breath sounds over the lower lung fields. A grade 2 pulmonic systolic murmur was noted. There was two-plus ankle edema and dermatographia. Laboratory work done at this time revealed a slight normocytic anemia, a sedimentation rate of 27 mm./hour, a trace of albumin in the urine, and a positive LE test. Chest films and an electrocardiogram revealed bilateral pleural effusion, cardiomegaly, and evidence of coronary in-

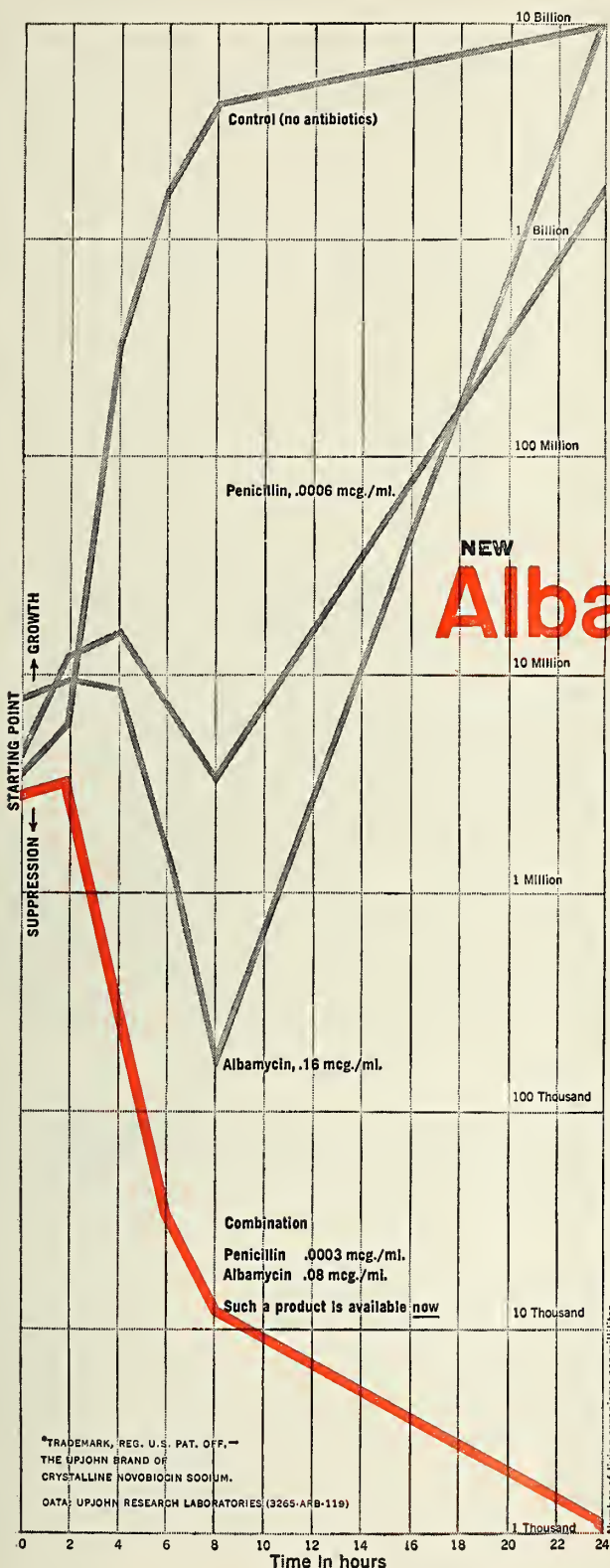
sufficiency. The patient was placed on 100 grains of salicylates daily and did well for four months. At this time angina, which had disappeared, recurred. There was associated fever and a skin rash, and the patient had several convulsions. She was hospitalized, given cortisone and anti-convulsants, and responded well within a few days. In the next nine months only a persistent low grade fever and polyarthralgia were noted.

At the end of this period it was noted that ecchymoses had appeared over the patient's legs. Platelet counts and clotting times were normal, and this was thought to be due to extensive thrombophlebitis. There has been no return of frank congestive failure since early in the course of observation. The patient was doing well when seen in the spring of 1955 and was continuing to take 60 grains of salicylate daily.

Case 8. F. H., a 31-year-old white woman, was first seen in February, 1954. Chief complaint at this time was abdominal bloating and facial edema of five days' duration. The onset of difficulty began in non-specific form after the birth of her second child, some three years prior to this time. Symptoms had consisted of malaise and chronic low grade fever. One year prior to the time she was first seen she was hospitalized for "flu." Her symptoms at this time were fever, aching, malaise, and cough, coupled with a skin rash and stiffness of the joints of both hands. She gradually recovered without treatment. Past history and review of systems were otherwise non-contributory.

Physical examination revealed a grade 2 systolic murmur at the base and heard widely over the precordium. There were scattered rales at both lung bases. The liver was palpable four fingers below the right costal margin. Chest plate revealed bilateral pleural effusion, and the electrocardiogram showed evidence of pericarditis. Laboratory work showed a sedimentation rate of 28 mm./hour, a hemoglobin of 65 per cent, two plus albuminuria, and a positive LE test. The patient was placed on heavy salicylate dosage. In two months the pleural effusion had largely cleared, the liver was palpable one fingerbreadth, and the murmur had become reduced in intensity. Ten months after the patient was first seen symptoms had largely subsided, with the exception of some dizziness and chronic fatigue.

Case 9. D. V., a 30-year-old white woman, was first seen in hospital consultation. Chief complaint at this time was aching substernal pain. History revealed that the pain was the latest of a series of symptoms which had developed over the past year. The patient had first noted a mild polyarthralgia, which had become steadily worse. Prior to the development of pain the patient had noted palpitation with tachycardia. Other history was non-contributory.



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Physical examination revealed an indurated skin rash of butterfly distribution, tachycardia of 110, and electrocardiographic evidence of pericarditis. Laboratory procedures revealed a moderate normochromic, normocytic anemia, a sedimentation rate of 20 mm./hour, and a positive LE test. Follow-up study was limited to only a few months. In this period of time the pericarditis had disappeared. The patient had begun to complain of chronic fatigue and described the symptoms indicative of a mild Raynaud's phenomenon which had developed after the period of original observation.

The cardiovascular manifestations of lupus have been previously alluded to. Osler³⁰ was the first to describe pericardial and endocardial involvement, but the previously mentioned work of Libman and Sacks²⁶ was the first description which drew much attention to their occurrence. The verrucous endocarditis has been described above. Other manifestations of cardiac disease may be seen. Myocarditis is a frequent finding.

Jessar²¹ reported pericarditis in 23 per cent of his patients with pericardial effusion in 16 per cent. Baggenstoss⁴ described the frequent finding of diffuse and focal pericarditis. In general the pericarditis is not remarkable in appearance, although some authors claim that the histology is distinctive. Harvey and colleagues¹⁹ reported the finding of some type of cardiac involvement in 55 per cent of their patients. Included in this group are the cases in which some detectable evidence of myocardial, pericardial, or endocardial involvement was found.

The myocarditis of lupus is similar to that of rheumatic fever, consisting of hyaline change and focal necrosis. It is due in large part to vascular involvement leading to ischemia, although such a relationship cannot always be determined. Harvey also reports that only one-half of patients with lupus myocarditis demonstrated significant embarrassment of cardiac function. There are numerous reports of cardiac failure in the course of lupus, most failure being amenable to the therapy directed against the lupus. Jessar²¹ states that some evidence of cardiac involvement, usually in the form of enlargement or murmurs, in addition to pericarditis, was present in 70 per cent of his cases at some time.

There is some evidence that potentially dangerous but silent cardiac involvement may be present in some patients with lupus. Two of Harvey's patients developed rapid intractable heart failure and died during cortisone therapy. At autopsy extensive lupus myocarditis was found. This suggests that unusual stress should be avoided during periods of active disease.

GASTROINTESTINAL

Case 10. W. S., a 38-year-old white woman, was first seen in February, 1954. Presenting complaints

were largely those of functional bowel distress and a burning sensation in the face and throat. System review and past history were non-contributory. Physical examination revealed no abnormalities except a marked dermatographia. Results of laboratory work were within normal limits. A slightly elevated temperature was present and was recorded consistently over the next few weeks. Complaints during this time were of abdominal distress—bloating and gas—fever, and transitory weakness. In an attempt to explain the temperature elevation routine agglutinations were performed, as was an LE test. The latter was positive. When last seen, there had been only one objective sign of lupus, the marked dermal hyper-reactivity. Skin rashes have frequently been observed in this patient following contact with many different substances and with several antibiotics.

In these patients, as in most of those reported, the gastrointestinal manifestations of lupus were not of a consistent enough nature to constitute a valuable sign of the disease. In Osler's original study³⁰ gastrointestinal symptomatology was prominent. The fact that most observers have noted fewer such symptoms has led many to feel that the cases reported by Osler were not typical. It seems that the major point of difference lies in the fortuitous nature of the anatomic lesion in the bowel, as it seems to be predicated entirely on the basis of vascular insufficiency of various degrees. Reifstein³³ reported evidence of peritonitis of varying extent in 72 per cent of his cases. McMeacham²⁷ reported a case in which the presenting picture was intestinal obstruction following infarction of the small intestine. Harvey¹⁹ states that esophagitis was present in seven of his cases, and abdominal cramping, in some cases associated with bloody diarrhea, was encountered with some frequency.

JOINT MANIFESTATIONS

Case 11. L. D., a 27-year-old white man, was first seen in 1951 following hospitalization for appendicitis. Presenting complaints at this time were headache, dizziness, and bloating. Past history revealed only the presence of a chronic epididymitis following a fall and various genitourinary complaints since that time. Physical examination was not remarkable. Laboratory work revealed only a one-plus albuminuria which has been persistent through the course of his illness. In the next six months the patient began to develop a low grade persistent fever and arthralgia. During the next months these symptoms continued, and an LE test at this time was positive. By early 1954 a persistent fever of 100 was recorded, and there was incapacitating fatigue. A severe frontal headache developed.

In June, 1954 the patient developed a peptic ulcer, and thereafter the typical symptoms of this lesion

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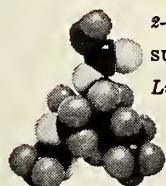
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were added to those already present. In early 1955 the main symptoms were again fatigue and headache. Physical examination remained negative throughout this time. Repeated positive LE tests were obtained. The next prominent symptoms developed in June of 1955. These consisted of dizziness, frequent fainting spells, and tinnitus. When last seen he was again asymptomatic, with only fatigue and headache remaining.

The joint manifestations of lupus are varied. Arthritis and arthralgia are prominent in the course of the disease. Three main groups may be recognized: first, myalgias and arthralgias; second, acute or subacute migratory polyarthritis; third, chronic progressive polyarthritis with deformity. Harvey¹⁹ states that in his experience the first group is by far the most common. In the majority of his patients pain without redness, associated with minimal soft tissue swelling and tenderness, was the prevailing picture. This was true in the group reported here. In none of the three patients who complained of joint pains was there any deformity. The joint manifestations are subject to frequent remission and are among the earliest benefited by the usual therapeutic measures.

There are two other important manifestations of systemic lupus which we have not considered in the above descriptions. These are the renal and ocular signs of the disease. The former has been alluded to under the description of the pathology of lupus.

None of these patients showed evidence of renal involvement beyond albuminuria. The findings may be scant, as in this group, or may progress to azotemia, with this condition being the immediate cause of death. Albuminuria is a frequent finding, as are white and red cells in the urine. Formed elements include waxy, fatty, and red cell casts. This has been claimed by some to be of important diagnostic significance, as this combination is rarely found in a single specimen of urine except in systemic lupus.²⁴ The usual urinary findings of moderate degree consist of albuminuria, slight hematuria, some cylindruria, either alone or in combination, with good preservation of renal function.¹⁹

In those patients who show more serious involvement there may be grossly disturbed renal function tests, massive albuminuria, and inability to concentrate urine. A useful diagnostic point is that frequently these patients show severe degrees of renal involvement without developing hypertension. When present, renal failure constitutes a frequent cause of death in those with systemic lupus erythematosus.

The ocular involvement in this disease was likewise not shown in this series of patients. The findings are those of several types of retinal lesion, the most common being the finding of cytoïd bodies on exam-

ination. These are typically in the posterior fundus and are usually not as large as the disc. Other retinal lesions are seen, usually in association with those conditions with which they are usually found, e.g. papilledema with hypertension. Jessar²¹ found retinal involvement in 20 per cent of his cases, the most common being the cytoïd body. Harvey¹⁹ states that these changes, in the absence of hypertension or diabetes, may constitute valuable ancillary evidence in the diagnosis of lupus. He states that they are transitory and that repeated examination may be necessary to recognize their occurrence.

Diagnosis

From the above discussion of clinical manifestations it may be seen that the diagnosis of systemic lupus may be extremely easy or may be of such obscurity as to be virtually fortuitous. It is a multiple system disease, as discussed earlier, and the system involvement may or may not be concurrent. As any pathological process may be severe or mild, so may be the signs and symptoms of lupus. Furthermore, the system involvement may not only not be concurrent, it may be in evidence many months or years after the initial signs, and the original signs may have vanished in the meantime. As pointed out, such diverse findings as false positive serologic tests for syphilis and grand mal seizures may constitute the presenting or indeed only evidence of the disease. Beyond the finding of isolated organic signs, the subjective symptomatology in the patients reported in this paper was that usually associated with functional distress, thus opening another diagnostic abyss to avoid.

Fortunately the picture is usually not so dim. In most patients careful observation over a period of time will reveal other signs of the actual process. One has general principles upon which to proceed. The most general of these is the predilection of the disease for women, usually those in the childbearing age. A second consideration is the investigation of "fever of undetermined origin" with the possibility of lupus in mind. Nearly all patients will show a chronic low grade temperature elevation. Another prominent finding, present in the long course in nearly 90 per cent of patients,¹⁹ is arthralgia and/or arthritis. Next most frequent is the presence of dermatitis, the most common being frequent rashes following drugs, soaps, and other common allergens. The classic butterfly rash is seen in only 30 per cent of patients with dermatitis. History of sensitivity to sunlight is of significance.

As has been mentioned, anemia is a common finding, ranking next in order of occurrence. Pleurisy, usually of the dry type, is seen in roughly one-half



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of all patients, as is some form of cardiovascular abnormality, the most common being systolic murmurs at the base and pericarditis.

The above embrace the major findings in lupus. The presenting picture, however, may be obscure, and the establishment of the diagnosis rests mainly on the presence of a high index of suspicion. Where presenting evidence is scanty the LE test, which is an inexpensive, workable procedure, has made possible a definitive diagnosis in cases which were not previously amenable to study. No indications can be quoted for the performance of the test for the reasons outlined above. It is reasonable, however, to say that it should be included in the diagnostic work-up of unexplained fever and in those cases in which a positive test for syphilis is found in those patients in whom contact is doubtful, and it should be performed on those patients who present themselves with purpura or hemolytic anemia. Only by investigation of these conditions can the obscure case be found.

Course and Prognosis

Ideas of the typical course of lupus are undergoing change, and consequently so is the prognosis. The prognosis of the classical case is difficult to glean from the limited literature on the subject, and the diagnostic criteria were such as to virtually exclude the mild case. The course has been thought to be one of progressive decline, with five-year survival rate.

Much of the difficulty has come about because of attempts to assign such survivorship to a time when the disease was presumed to begin—that is, subjective symptomatology of varying length was taken as the onset of the disease. While this was no doubt accurate in many cases, it does not admit of careful analysis. Also, the occasional fulminating case with rapid death is much more apt to be recognized, and therefore plays a disproportionate role in determining prognosis.

Throughout the literature one can find isolated cases of long survival such as that reported by Ben-Asher.⁶ His patient had survived systemic lupus for 23 years at the time of writing. Jessar²¹ made the statement that approximately 20 per cent of patients can be expected to survive for five years after diagnosis, but in arriving at this figure he included as dying all patients who had not yet been followed five years or longer. Tumulty⁴⁰ predicted an average over-all course of seven years, leading to death. The most extensive statistical analysis is that of Merell and Shulman.²⁸ It is beyond the scope of this paper to delve into the methods used in arriving at their figures. Table IV illustrates the findings of survivor-

ship as far as they were able to carry the study—four years.

TABLE IV
ESTIMATED SURVIVORSHIP AFTER
DIAGNOSIS

| <i>Years after diagnosis</i> | <i>Per cent survival</i> |
|------------------------------|--------------------------|
| 0 | 100 |
| 0.25 | 87 |
| 0.50 | 85 |
| 0.75 | 82 |
| 1.00 | 78 |
| 2.00 | 67 |
| 3.00 | 62 |
| 4.00 | 51 |

In an attempt to arrive at an adequate clinical basis for prognostic studies, several classifications of the disease have been proposed, that of Urbach⁴¹ being widely quoted. It is the feeling of most authors that since the severity and symptomatology of the disease vary widely and rapidly, such classification is of little use.^{19, 21, 40} An accurate prognosis cannot be given with the present knowledge available. The course is more chronic than had generally been accepted.⁴⁰ As more cases are recognized in a mild form, the average survivorship will probably be found to be longer than is now felt to be true. None of the patients presented in this paper have been followed for more than three years after diagnosis, so as yet no statements can be made, except that the usually observed high death rate in the first six months following diagnosis has not been seen.

Treatment

Numerous compounds have been tested in the therapy of this disease. Among them are ACTH and cortisone, salicylates, gold, vitamin B₁₂, nitrogen mustards, para-amino benzoic acid, and various anti-malarials. With the exception of the first three mentioned, none has been demonstrated to be of much service.

Cortisone was found to be of benefit shortly after it became available. Among early reports is that of Brunsling¹⁰ who treated seven patients with doses of 200 mg. of cortisone daily until remission was obtained or contraindications developed. He found that arthralgia, fever, and serositis were rapidly benefited by this treatment. During the course of treatment one patient died of renal abscesses, and two manifested psychotic symptoms. Dubois¹² gave sufficient cortisone to produce early Cushingoid changes and felt that the treatment, while it produced some remissions, probably did not materially alter the length or the course of the disease. He also stressed

50

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the fact that spontaneous remission is so frequent as to cloud the effect of whatever therapy is being employed.

Soffer³⁹ reported on a series of 18 treated patients. His initial dosage was 100-200 mg. of ACTH and 200-300 mg. of cortisone. When remission was obtained he kept his patients on a maintenance dose of 20-50 units of ACTH and 50-100 mg. of cortisone daily for varying lengths of time. His findings were similar to those of Brunsling—the serositis, fever, and arthritis subsided with dispatch while the presence of LE cells and renal findings were little affected. In his series six patients died, and eight were maintained on hormones at the date of the report.

Harvey and his colleagues¹⁹ have reported the most complete review of therapy thus far. Among these patients are some treated intermittently, some continuously. In general he found that the optimum of treatment was that which is necessary to bring about relief of symptoms, thus disagreeing with Dubois. He also found that the degree of remission of renal lesions varied, some patients showing a drop in non-protein nitrogen and uric acid levels. It is important to realize that general medical problems arise in those patients with systemic lupus, and they must be treated as such. In this group of patients only three were seen at a time in their illness when cortisone therapy was warranted. These patients were treated primarily with heavy doses of salicylates, and it was found that satisfactory control could be maintained in most. This is in general agreement with most authors, although it is conceded that during acute exacerbations of the disease the hormone therapy is to be preferred.

Summary

Eleven cases of disseminated lupus erythematosus have been presented, along with a review of the disease, which illustrate the changing diagnostic and prognostic ideas of the illness. It is held that the disease is one of more chronic nature than has generally been recognized. As the problem of diagnosis has contributed materially to this impression, some discussion of clinical manifestations has been advanced. The importance, practicality, and reliability of the test for LE cells in the earlier and more frequent diagnosis of systemic lupus erythematosus has been presented.

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BOOK REVIEWS

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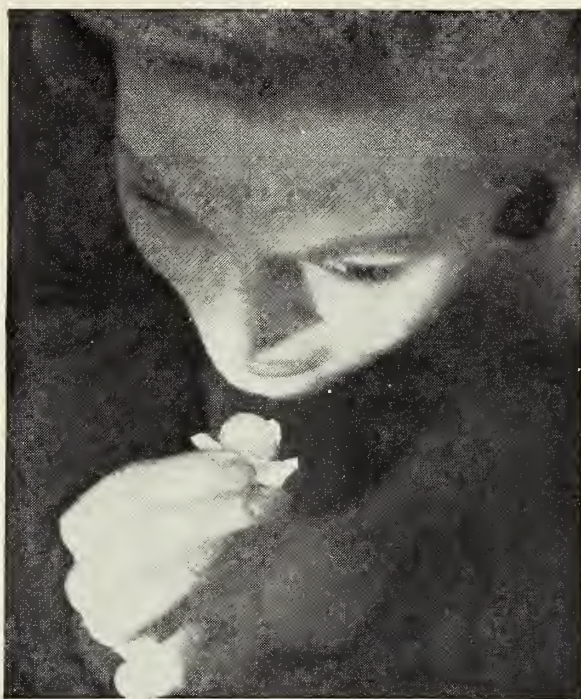
Physiology is emphasized throughout the book. A physiologic explanation of signs and symptoms and choice of therapy is given whenever possible. At times the author is rather dogmatic in advising one type of treatment over another, but in each chapter there is an extensive bibliography for the reader who wishes more information on a specific subject. The author has done an excellent job in attempting to cover the extensive field of heart disease. This book is highly recommended.—W.G.C.

Dermatology. By Donald M. Pillsbury, M.D., Walter B. Shelley, M.D., and Albert M. Kligman, M.D. Published by W. B. Saunders, Philadelphia. 1331 pages, 564 figures. Price \$20.

In the words of the authors, "An addition to the many comprehensive books of reference on the diseases of the skin requires some justification." But in the case of this all new volume, the book is its own justification.

It is seldom that one text can fill the needs of both students and practitioners, but this one approaches it. The lack of synonyms and eponyms produces a simplified text. This is a feature long overdue in medicine in general and dermatology specifically, but it may make the book difficult to use, i.e., hard to find things in. The bibliography has been reduced to a few key articles, and the rarer conditions are given short shrift.

The book is exceedingly well written, and one never feels enmeshed in the complications and variations of disease pictures. As would be expected, the sections dealing with the special interests of the authors receive special attention. Being a reference work, it serves mainly as a catalogue of clinical syndromes, and the classification of diseases is more or less standard; the authors have used etiology when possible. But it is more than that: for instance, the recent revolution in syphilology has produced profound changes in all textbooks, but no place will one find a more lucid or concise description and guide to therapy than the 30 pages devoted to syphilis; the chapters on "basic sciences," with their appended summaries, are worthwhile, and a section titled "Principles of Diagnosis" is unique in that it con-



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siders methods of dermatologic diagnosis from various angles, including types of lesions, distribution patterns, relative incidence in various age groups, climate, etc.

The discussions of therapy receive the same concise treatment as the clinical descriptions. One sometimes has the feeling that these men are therapeutic annihilists, but if the treatment of a condition is unsatisfactory, they say so.

If the book has a fault, it is, perhaps, over-simplification. The book is too big to read as a "system" of dermatology and contains too much material besides clinical descriptions to be a comprehensive reference work, but for the seasoned practitioner, as a guide to clinical course therapy and clinical follow-up, and for the student who is reading with direction, this book has no peer.—C.M.L., Jr.

Pediatrics. Edited by Donald Paterson, M.D., and John Ferguson McCreary, M.D. Published by J. B. Lippincott Company, Philadelphia. 654 pages. Price \$14.

This is a good pediatric book. Like any book or text it leaves some things to be desired, but I believe it could occupy an important place on the bookshelf of one treating children.

This, as it is announced by the publisher, is a practical book. It would not be valuable as a reference text since it is more concerned with the commonplace. I'm sure this will not replace our several classical texts of pediatrics or the extensive volumes of pediatric writing. It should, however, prove an excellent source of quick reference in regard to puzzlers that often face the practitioner. The book lacks extensive discussions on rarity but contains practical material on the most frequent conditions. The rare diseases and conditions are mentioned, but one would need other sources of information on most.

This book should be especially useful to the young practitioner who needs immediate practical answers. It may be a good text for the shelf in the out-patient department.

I find that Canadian authorities make fluid balance and electrolytes just as confusing as other writers. There are also other questionable ideas and recommendations concerning management and treatment, but I believe these are minor.

The section of the book that deals with the retarded child and advice to parents of the retarded child is excellent. I believe the thoughts in this section justify the price of the book and certainly will help the physician face this unfortunate situation.

It also seems worthy of note that these authors have seen fit to include a separate chapter on school health and public health. Thus one concludes that the

authors are in touch with the trend that the practicing physician must inevitably concern himself more and more with preventive medicine—i.e., well child conferences and school health.—H.P.J.

Examination of the Nervous System—A Student's Guide. By A. Theodore Steegmann, M.D. Published by Year Book Publishers, Inc., Chicago. 164 pages. Price \$3.75.

To elicit and interpret adequately findings in the examination of the nervous system requires the studied practice of examinational techniques peculiar to this organ system. It is for this reason that students of medicine, not only in their academic years but in practice of the art, have difficulty in the evaluation of clinical problems involving the nervous system. The brief, concise, well illustrated technical manual of the type composed by Doctor Steegmann therefore has real usefulness to the student in training and may also serve as a handy, ready reference to technical information in the evaluation of neurological symptoms and signs for the practitioner. Simple, direct descriptions of technique, plus easily understood correlations with neuroanatomical and physiological facts, and finally useful illustrations and charts of nerve distributions and patterns, enrich the usefulness of this small and unpretentious contribution.—J.A.S.

The Truth About Cancer. By Charles S. Cameron, M.D. Published by Prentice-Hall, Inc., New York City. 268 pages. Price \$4.95.

The title of the book expresses well the reader's interpretation of its contents. It presents both optimistic and pessimistic views on various types of cancer. It corrects many misconceptions about this disease and gives good factual information.

While the book does contain some repetition of the American Cancer Society educational program, it also presents a lot of additional information of interest.

It is a reference book which would be of benefit to everyone in helping to understand the nature, causes, diagnosis, and treatment of cancer. It also builds up the confidence of the American people by showing the great strides research has already made in the cure and treatment of this disease.—R.M.D.

Principles of Clinical Electrocardiography. By Mervin J. Goldman, M.D. Published by Lange Medical Publications, Los Altos, California. 310 pages. Price \$4.50.

This is a unique textbook in two respects. The actual text has been made as concise as is possible. Perhaps for this reason it occasionally loses clarity,

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No actual tracings are to be found in the book, and while this might be over-simplification of a complex subject it in itself maintains the book's lucidity. This is an excellent book for the student and practicing physician.—M.H.D.

Sick Children. Seventh Edition. By Donald Paterson, M.D. Revised by Reginald Lightwood, M.D. Published by J. B. Lippincott Company, Philadelphia. 590 pages. Price \$8.75.

In the preface to the first edition Dr. Paterson states that this volume is designed for the senior medical student and the general practitioner. Although a new section on tropical diseases in childhood has been added and the text enlarged and vastly rewritten by Dr. Lightwood, the reviewer feels that this work fills that niche. It is not a reference text.

Physically the book is easily handled because of its convenient size. The type size and sentence phrasing are excellent; consequently reading is rapid. Disease entities are sharply defined and resulting pathology is clearly outlined. In all there are 26 well organized chapters and four appendices. There is a fairly liberal supply of charts, pictures, photomicrograph and x-ray film reproductions, etc. The index is complete and useful although in this particular copy the bookbinder inadvertently shuffled the pages so that some confusion exists.

It does seem in some instances that descriptive symptomatology receives less than the necessary space allotment in spite of the commendable emphasis the authors have placed on history taking as an important part of pediatric problem evaluation. The "feel" of the section devoted to this phase of medicine convinces the reviewer that the authors are sound and experienced clinicians. The sections on cardiac and circulatory disorders, juvenile rheumatism, chorea, carditis, and infectious diseases receive more attention than some of the less frequently seen syndromes and diseases.

Reference to laboratory findings as an aid to diagnosis is slight, yet normal values for blood chemistry determinations, hematological normals, cerebral spi-

nal fluid findings, urine test results, and fecal examinations are conveniently imprinted on the front and back inside covers. Little space is devoted to specimen collection, however. The problem of therapeutic management of amenable infectious processes is interestingly handled by the use of constant reference to an appendix of chemotherapeutic and antibiotic drugs.

Obviously there is occasional reference to certain trade names for milk preparations, drugs, etc., as well as certain staple food preparations in the United Kingdom that are strange to the American reader, but as the context is clear this situation poses no problem. It is quite possible that the American pediatrician will not agree completely with some of the feeding and training suggestions advanced.—T.C.H.

Handbook of Physical Therapy. By Robert Shestack. Published by Springer Publishing Company, New York. 212 pages. Price \$4.25.

This small volume is intended to be of value in presenting the resources of physical therapy and point out the clinical conditions that may be benefited by the use of such physical measures.

The book is divided into four general sections. The first is concerned briefly with the history of physical therapy and the ordering of physical therapeutic procedures. The second section discusses various physical therapy modalities from the standpoints of their physiological basis and applicability under clinical circumstances. The third section discusses the various medical conditions for which physical therapy may be employed. The final section deals with bodily movements produced by muscular action.

The reviewer feels that the author has made an earnest attempt to present physical therapy procedures in such a fashion that the average physician or physical therapist would be familiarized with the benefits derived from the use of such procedures and would thus be more prone to employ them. The section on therapeutic exercise is the best effort of the book.

While the style of presentation is informal and permits easy reading, much of the discussion is vague, there is considerable repetition of material, and some statements represent either carelessness or confusion on the part of the author. Part of the vagueness relates to the author's intent not to discuss medical matters medically, yet his failure to include collaborative medical discussion leads to the unwholesome conclusion that the therapist needs only to treat the diagnosis. Many conditions are discussed repetitively under each modality. The axillary nerve is referred to as the auxiliary nerve. The autonomic ganglia are referred to as autonomous ganglia. In discussing dia-



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thermy, the terms intensity and frequency are used interchangeably, which, of course, they are not. The only illustrations in the book are motor point charts which by now are approximately 50 years old and scarcely represent new information. The reviewer found it difficult to follow part of the material presented, as procedures employed in treatment were given the same headings as the conditions described, a circumstance which caused the reader quickly to lose sight of the diagnostic entity. There is a bibliography at the end of the book included apparently as an afterthought, as it is never referred to in the text proper.

There is little new in the book. The observations made by the author are not original but are common knowledge among those who work closely in this field. Physical therapy and nursing students will find much useful information in this text. Physicians, graduate therapists and nurses will undoubtedly find helpful hints derived from the practical experiences of the author.—*D.L.R.*

ANNOUNCEMENTS

Course of instruction on psychiatry in occupational health, Institute of Industrial Health, College of Medicine, University of Cincinnati, March 11-15. Write the secretary, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

More than 100 postgraduate courses each year, New York University Postgraduate Medical School, 550 First Avenue, New York 16, New York.

Annual scientific and clinical session, American Congress of Physical Medicine and Rehabilitation, September 8-13, Hotel Statler, Los Angeles. Information available from the secretary, 30 North Michigan Avenue, Chicago 2, Illinois.

Alumni postgraduate convention, College of Medical Evangelists School of Medicine, Los Angeles, March 10-14. Refresher courses, lectures, panels, exhibits. Category I credit by A.A.G.P. Information available from managing director, 316 North Bailey Street, Los Angeles 33, California.

Twentieth annual meeting, New Orleans Graduate Medical Assembly, Municipal Auditorium, New Orleans, March 11-14. Write the secretary, 1430 Tulane Avenue, New Orleans 12, Louisiana.

Postgraduate courses on diseases of the chest, sponsored by Council on Postgraduate Medical Edu-

cation of American College of Chest Physicians, February 25-March 1 at Mark Hopkins Hotel, San Francisco, and April 1-5 at Bellevue-Stratford Hotel, Philadelphia. Tuition \$75. Write the director, 112 East Chestnut Street, Chicago 11, Illinois.

Annual essay contest sponsored by Mississippi Valley Medical Society. Any subject of medical or surgical interest acceptable, also medical economics and education. Deadline for submitting entries May 1, 1957. Write the secretary, 209-224 W.C.U. Building, Quincy, Illinois.

Ninth annual scientific assembly, American Academy of General Practice, Kiel Auditorium, St. Louis, March 25-28. Congress of Delegates meeting, March 23. Sessions of congress and social functions at Sheraton-Jefferson hotel.

Fourth interim congress, Pan American Association of Ophthalmology, and annual meeting, National Society for the Prevention of Blindness, April 7-10, Hotel Statler, New York City.

Winter and spring series of seminars to study uptake of radioiodine by the thyroid, Medical Division, Oak Ridge Institute of Nuclear Studies. Information available from ORINS Medical Division, P. O. Box 117, Oak Ridge, Tennessee.

Annual M. D. Anderson Hospital and Tumor Institute symposium on fundamental cancer research, University of Texas, Texas Medical Center, Houston, March 7-9. General subject is "Viruses and Tumor Growth."

Course on fractures and other trauma, Chicago Regional Committee on Trauma, American College of Surgeons, April 10-13, John B. Murphy Auditorium, Chicago. Write John J. Fahey, M.D., 1791 West Howard Street, Chicago.

Sectional meeting, American College of Surgeons, New Orleans, February 4-7. Details available from H. Prather Saunders, M.D., 40 East Erie Street, Chicago.

Celebration recognizing 100th anniversary, Academy of Medicine of Cincinnati, February 27-March 5. Exposition featuring 175 exhibits open to public.

First American Post-Graduate Assembly in Fertility and Sterility, May 18-31, under sponsorship of New York Medical College-Metropolitan Medical

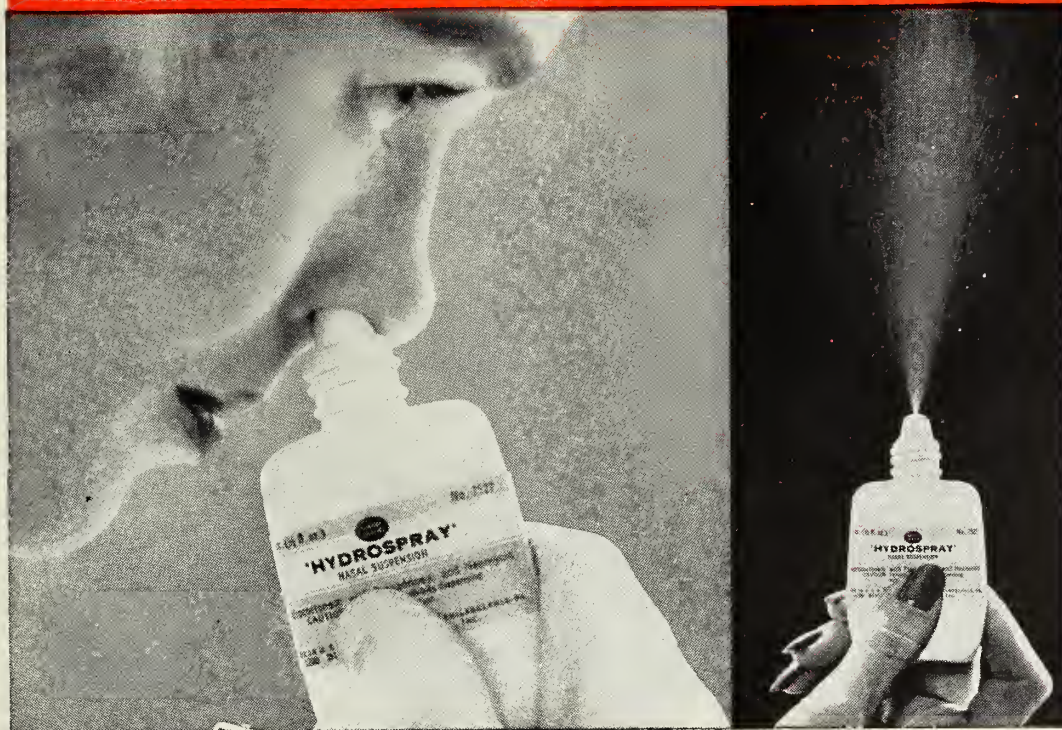
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Volume LVIII

FEBRUARY, 1957

No. 2

Water and Electrolytes

A Study of Electrolyte Balance in a Series of Surgical Cases

THOMAS J. LUELLEN, M.D., *Wichita*

The occasional development of fluid and electrolyte imbalance among patients on the surgical service has stimulated us to seek the most practical way to prevent and treat this problem through facilities available in the local community. Darrow and Pratt¹ have indicated that the proper use of water and electrolyte solution is responsible for saving more lives in seriously ill patients than the use of any other type of substance. Scribner et al.² have indicated that the proper care of fluid, electrolyte, and nutritional needs improves the age factor in a seriously ill patient by as much as 20 years.

In 1950 Scribner³ proposed a chloride and water balance procedure. His bedside chloride method is simple. Two years later, Statland⁴ proposed a fluid balance service in which daily measurements were made of the fluid, sodium, and potassium losses, using a flame photometer. In the present study a number of postoperative cases has been followed utilizing those features of both methods which seemed best adapted to our particular needs.

Methods and Materials

A series of 32 cases has been followed after 35 major surgical procedures. Two cases of intestinal obstruction not requiring surgery were also studied. In each case the daily balance of water and chloride was tabulated, using the Scribner method.³ The daily balance of sodium and potassium was determined, using a flame photometer. In some cases the surgeons

wrote the fluid orders as we collected the balance data, while in the remaining cases the author took full responsibility for writing the fluid and electrolyte orders. The complete daily fluid and electrolyte intake and output data were tabulated on a form developed by Scribner.² A technician determined the pH and chloride content of the urine and gastrointestinal fluid losses each morning at the bedside, and later in the laboratory used the flame photometer to measure the potassium and sodium values of the secretions.

A comparison of estimated and measured electrolyte losses in the postoperative period leads to interesting conclusions.

An example of a hypothetical case is shown in Figure 1. The intravenous bottles were numbered consecutively, and the empty bottles were saved for inspection in order to avoid confusion in tabulating

| Vol. | INTAKE | K ⁺ | Na ⁺ | Cl ⁻ | Vol. | OUTPUT | K ⁺ | Na ⁺ | Cl ⁻ |
|-------|--------------|----------------|-----------------|-----------------|-------|-----------------------|----------------|-----------------|-----------------|
| | Intravenous | | | | 1500 | Urine | 60 | 50 | 50 |
| 0 | Dial | | | | 1000 | Sensible & Insensible | 0 | 0 | 0 |
| 0 | Tube feeding | | | | 1500 | Gastric suction | 15 | 75 | 150 |
| 1,000 | IV #1 | 20 | 50 | 70 | | Fistula | | | |
| 1,000 | IV #2 | 20 | | 70 | | T-tube drainage | | | |
| 1,000 | IV #3 | 20 | 50 | 70 | | Diarrhea | | | |
| 1,000 | IV #4 | 20 | 75 | 45 | | | | | |
| | Totals | 80 | 125 | 205 | 4,000 | Totals | 75 | 125 | 200 |

Figure 1. Hypothetical case showing how fluid and electrolyte are recorded daily.

From the Department of Internal Medicine, Wichita Clinic. This study was made possible in part by the facilities of the Midwest Medical Research Foundation. Appreciation is due Gynith Giffin, M.S., for technical assistance and Cecil B. Read, Ph.D., University of Wichita, for statistical assistance.

the parenteral fluid intake for each 24-hour period. Urine and any gastrointestinal suction were saved in separate gallon jars, calibrated for volume. Each day the physician or technician measured and recorded the output of the previous day; then the jars were emptied, and collections of the output of the current day were begun. In each instance balance studies were continued until the patient began to take enough oral nourishment to indicate that his recovery was well assured. No attempt was made to calculate electrolyte content of oral intake except when formulas were used (as in tube feeding), when the electrolyte content was measured. Serum electrolytes were determined at least every three days.

The basic plan of therapy was (1) to replace completely any extrarenal losses from skin, respiratory, and gastrointestinal tract, (2) to give sufficient water and electrolytes to replace expected average losses in the urine, and (3) to partially correct any diagnosed excesses or deficits of fluid and electrolytes. Only partial correction of fluid imbalance was made each 24-hour period so that the possibility of overtreatment would be minimized. According to Scribner,² the kidneys of sick patients have a considerable range of excretory capacity per 24 hours with the following average figures: water 1,500 cc., potassium 60 mEq., sodium 50 mEq., and chlorides 50 mEq.

Results

The average concentration of potassium, sodium, and chloride in the gastric suction, bile, and liquid stools was determined for this series of cases. The average total daily loss of these same electrolytes in gastrointestinal fluids and urine was also calculated for each case.

Electrolytes in Gastrointestinal Fluids: In calculating the average concentration of the electrolytes in gastric suction, data was used only on those days in which the oral intake was 600 cc. or less to minimize the effect of dilution. It will be noted (Table I) that the average concentration of potassium in gastric suction was somewhat less than 10 mEq. per liter. The average sodium concentration was about 50 mEq. per

liter, and the chloride concentration was about 90 mEq. per liter. The concentration of these three electrolytes in bile was similar to that of plasma. The stools contained a relatively high concentration of potassium which averaged about 40 mEq. per liter. The sodium concentration in the stools was somewhat higher than that of gastric suction at 60 mEq. per liter, and the chloride concentration was considerably less, being 45 mEq. per liter.

The purpose of the study was to find a simple means of maintaining fluid and electrolyte balance which would be adequate in most postoperative cases as well as in medical cases in which parenteral feedings become necessary. Since renal losses were replaced with average amounts, and sensible and insensible losses were estimated, the only losses actually measured for accurate replacement were those of the gastrointestinal fluids. These were lost from the body by emesis, drainage, or diarrhea.

Since the concentration of the individual electrolytes in each type of gastrointestinal fluid tends to follow a pattern, a simplified table modified from Lockwood and Randall⁵ was constructed (Table II). The values of stool electrolyte concentrations in this table are those quoted in Scribner's syllabus.² It was then decided to test the practical validity of this table of approximate values, using the data obtained in the present series of cases.

To have a basis for comparison, the average daily measured gastrointestinal loss of potassium, sodium, and chlorides was determined for each case. This was accomplished by dividing the total gastrointestinal loss of each of these electrolytes by the number of days followed in each case.

For comparison with these measured values, the average daily loss of each of these electrolytes in the gastrointestinal drainage was then estimated for each patient. This was done by multiplying the average daily volume of measured loss in liters by the average concentration per liter as listed in Table II for the appropriate fluids. For example: if the average daily gastric suction was 1,500 cc., the estimated daily loss

TABLE I
ELECTROLYTE CONCENTRATION OF GASTROINTESTINAL FLUIDS

| Type of Fluid | Cases | Analyses | K | Na | Cl (mEq/L) |
|---------------------|-------|----------|------------------|---------------|-------------|
| Gastric | 16 | 88 | Mean 7.4 (± 2.8) | 47.2 (± 9.4) | 86 (±17.9) |
| | | | Range 3.2-13.2 | 31-62 | 47-112 |
| Bile | 4 | 34 | Mean 4.7 (± .9) | 133.1 (±12.9) | 100 (± 9.3) |
| | | | Range 4.3-5.4 | 124-138 | 92-109 |
| Liquid Stools | 6 | 52 | Mean 41 (±15.2) | 60 (±21.3) | 46 (±17.6) |
| | | | Range 19-57 | 39-101 | 22-72 |

Figures in parentheses represent standard deviation from the mean.

TABLE II
APPROXIMATE ELECTROLYTE
CONCENTRATIONS (mEq/L)

| | K | Na | Cl |
|--------------------------|----|-----|-----|
| Plasma | 5 | 140 | 100 |
| Bile | 5 | 140 | 100 |
| Gastric | 10 | 50 | 100 |
| Miller-Abbott | 10 | 100 | 100 |
| Ileostomy (recent) | 20 | 130 | 115 |
| Liquid Stools | 30 | 60 | 45 |
| (up to 70-100) | | | |

of chloride would be 1.5×100 , which equals 150 mEq.

The sodium losses in gastrointestinal fluids were also estimated by using the method of Scribner, which requires only the pH and determination of chlorides. Using this method, if the pH of the gastrointestinal fluid was 4 or less, the sodium concentration was estimated to be one-half that of the chloride. If the pH was 5, 6, or 7, the sodium concentration was estimated to be equal to that of the chloride. In the few instances where the pH was 8 or more, the sodium concentration was arbitrarily considered to be more than chloride in the same ratio as in plasma, that is 1.4 to 1. This method should not be used to estimate sodium in urine. In several of the earlier cases studied, the pH of the gastric aspirate was inadvertently not recorded. In these cases the sodium concentration was estimated to be one-half that of the chloride.

Comparison of Estimated and Measured Chloride Values: The average daily chloride loss in gastrointestinal suction and drainage as actually measured was compared with the estimated chloride loss in each case, using measured volumes and the table of approximate concentration (Table II). The measured values are indicated on the horizontal axis and the

estimated values on the vertical axis (Figure 2). If there had been perfect correlation, the values as indicated by the solid circles would have formed a straight line. The average of these values is represented by the solid line and shows a tendency to overestimate the gastrointestinal chloride loss by 15 to 20 mEq. per day when the table of approximate concentrations is used as opposed to actual measurement. The broken lines as drawn tend to contain about two-thirds of the values in the area between them. The coefficient of correlation (r) is 0.88. Perfection correlation would be 1.00. Most of the estimated values are within plus or minus 40 mEq. of the measured values. However, when the losses were large, the difference between measured chloride values and those estimated from volume alone were sometimes considerably more than 40 mEq. per day.

Comparison of Estimated (by Volume) and Measured Sodium Values: The daily average loss of sodium in the gastrointestinal fluids as estimated from volumes using the table of approximate concentration is compared with the measured sodium values in Figure 3. Again the measured values are plotted along the horizontal axis against the estimated values along the vertical axis for each case. The estimations tend to be 10-12 mEq. too high for the smaller values. The bulk of the cases tend to fall within plus or minus 20 mEq. of the average. The coefficient of correlation (r) is 0.92.

Comparison of Estimated and Measured Potassium Values: The estimated potassium values are compared to measured values in Figure 4. Here the coefficient of correlation (r) is the poorest, being 0.74. However, it will be noted that the actual amount of electrolyte is much smaller than in sodium and chloride and most of the estimated values fall within plus or minus 6 mEq. of the measured values.

Comparison of estimated (by pH and Chloride)

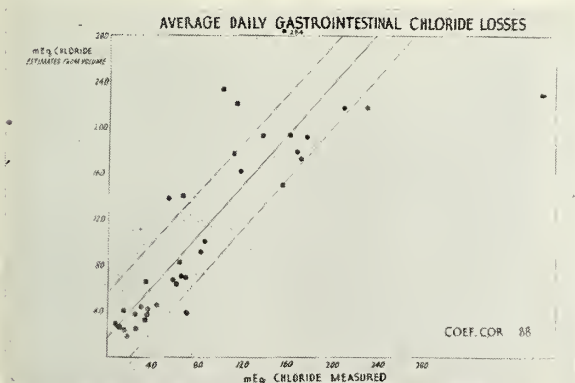


Figure 2. The average daily gastrointestinal chloride losses as estimated from volume are compared with the measured losses for each case. The coefficient of correlation (r) is 0.88.

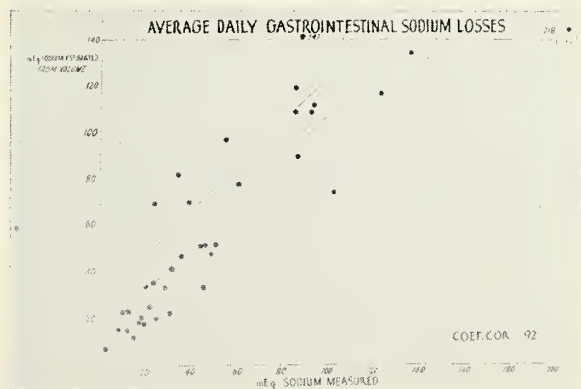


Figure 3. The average daily gastrointestinal sodium losses as estimated from volume are compared with the measured losses for each case. The coefficient correlation (r) is 0.92.

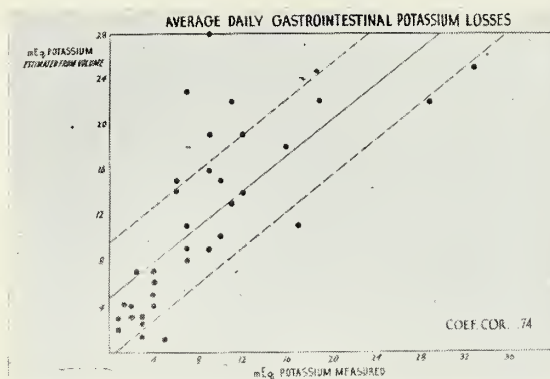


Figure 4. The average daily gastrointestinal potassium losses as estimated from volume are compared with the measured losses for each case. The coefficient correlation (r) is 0.74.

and Measured Sodium Values: The sodium was also estimated by a second method based on the pH and chloride method of Scribner. Again the average daily measured loss of sodium in gastrointestinal fluids was compared with estimated sodium values (Figure 5). The average of the estimate tends to run 3-4 mEq.

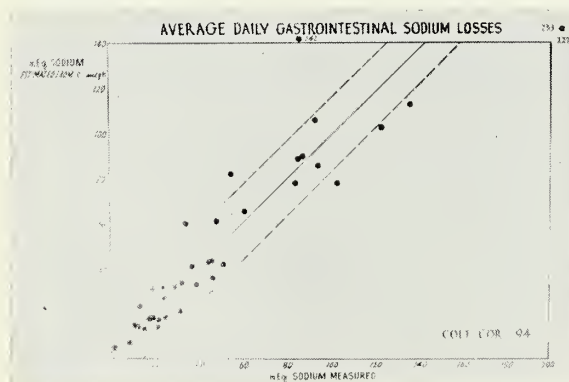


Figure 5. The average daily gastrointestinal sodium losses as estimated from pH and chloride values are compared with the measured losses for each case. The coefficient of correlation (r) is 0.94.

higher than the measured quantity. Most of the values fall within plus or minus 20 mEq. of the average. The coefficient of correlation (r) is 0.94. There tend to be fewer wide deviations from the measured values

TABLE III
AVERAGE DAILY ELECTROLYTE LOSSES
IN URINE

| 37 Cases—211 Days | | |
|-------------------|-------------|-------------|
| K | Na | Cl (mEq) |
| 50 \pm 21 | 65 \pm 51 | 73 \pm 47 |

than when the volume alone is used as a means of estimating sodium content.

Electrolytes in Urine: The average daily loss of potassium, sodium, and chloride in the urine was measured over the same period of time covered in the figures described above (Table III). The urine values, of course, vary widely and reflect to a great extent the amount of electrolytes which were administered during the prior 24 hours. However, Table III does indicate the average values obtained under clinical conditions in the cases followed. It will be noted that the average daily loss and standard deviations are as follows: potassium 50 plus or minus 21 mEq., sodium 65 plus or minus 51 mEq., and chloride 73 plus or minus 47 mEq. These average losses are similar to the average values given to replace daily renal losses as mentioned above. There was much variation from case to case, with some patients having salt depletion excreting very little sodium, while a high urinary output of potassium and sodium in other cases may have reflected excessive therapeutic administration of the various electrolytes.

Discussion

The average concentrations of potassium, sodium, and chloride in the various gastrointestinal secretions obtained are similar to these reported by others.^{6, 7, 8} In estimating the electrolyte content of the gastric suction, those patients who had had gastric resection were not differentiated from those who had had another type of surgical procedure, although Lans and Stein⁸ found a comparatively high sodium to chloride ratio in their patients with gastric resections. They surmised this was due to a considerable reflux of bile and pancreatic secretions. There were not enough gastric resection cases in this series to check this point.

Only tentative conclusions can be drawn with the small series which has been followed. It appears that estimating daily chloride loss from the volume of gastrointestinal fluids lost would usually deviate only a plus or minus 40 mEq. from the actual loss. However, in those cases in which estimates are low and in which a large daily loss occurs, a chloride deficiency could develop. Since the bedside chloride test is so simple to perform, it seems reasonable to measure the chloride if the volume of aspirate is over 1,000 cc. per day, as Scribner² advises. It should be pointed out, however, that one who is using the table of approximate electrolyte concentrations will often overestimate the chloride loss.

The estimated sodium losses, using the volume of suction fluid as a basis for evaluation, were usually within plus or minus 20 mEq. per day of the measured loss. It is probable that the therapeutic replacement of sodium, based on values estimated from volume, will usually be satisfactory. The exception to

this might be where suction and thus parenteral feedings are unusually prolonged and the sodium and chloride content varies considerably from the average values. In this series estimation of sodium using the chloride and pH values gave results similar to those obtained by estimating sodium values from volumes alone.

It appears that it should usually not be difficult to replace gastrointestinal potassium losses using only the estimates based on measured volumes; possible exceptions are in cases of severe diarrhea, in which the potassium concentration in the stools may be well over 40 mEq. per liter. If the urine output is over 500 cc. a day, and if one allows 50 or 60 mEq. of potassium per day for urine loss plus the gastrointestinal losses, it would appear that a potassium deficiency should rarely develop.

From this series definite conclusions cannot be made as to the ability of the kidneys of sick patients to excrete electrolytes. The average concentration obtained in the urine in these cases is consistent with the average values proposed by Scribner as long as the patient does not have a deficiency of electrolytes or an oliguria.

In practice the choice of proper fluid and electrolyte therapy may be difficult because it is likely to be the patient with other complications who will develop fluid and electrolyte imbalance. It may be difficult to determine which signs and symptoms are due to the patient's other problems and which, if any, are due to a fluid and electrolyte imbalance. In such cases clinical judgment seems more important than balance data.

The greatest difficulty was experienced in two types of patients: (1) those who were severely ill and in whom electrolyte imbalance had developed before balance studies were instituted, and (2) those patients with severe oliguria and jaundice. All fatal cases in this series had several features in common; rising blood urea nitrogen or oliguria, one or more episodes of shock, moderate to severe fever, and jaundice.

If the patient has oliguria, one must decide whether or not acute renal failure is present. In oliguria associated with renal failure, one may produce pulmonary edema or water intoxication if fluid intake is allowed to exceed fluid output. In such cases one should not give fluid and electrolytes to replace average urinary losses, but instead should replace actual urinary losses.

It would seem that fluid intake and output should be carefully measured in all cases in which gastrointestinal drainage, including T tube drainage, is required, and in those patients having severe diarrhea. This is true regardless of whether or not surgery has been performed.

One can often forestall the development of fluid

and electrolyte imbalance by replacing losses as estimated from measured volumes using a table of average concentrations. This series should be extended to see if future data will confirm the results obtained thus far.

The accurate collection of fluid output may constitute a problem, but it is usually quite easily handled if there is a special nurse on duty. If the patient is under the care of floor nurses, the chief problem is to avoid having the suction fluid or urine discarded inadvertently. It has been possible to overcome this problem on some floors by having a designated person on each floor responsible for recording the volume of intake and output at the end of each shift.

Most good risk patients seemed to tolerate well a moderate excess or deficiency of water and electrolytes. Apparently their kidneys were able to excrete electrolyte and fluid excesses or the patients were able to resume oral feedings before any clinically apparent deficiency developed.

Summary

1. Water, potassium, sodium, and chloride balance has been followed in 37 patients requiring parenteral feedings.

2. Estimated gastrointestinal losses of potassium, sodium, and chloride, using a table of approximate values have been compared to measured losses.

3. Most patients who had undergone surgery of moderate severity did not develop findings of electrolyte imbalance despite the use of a rather wide variety of postoperative fluid routines.

4. In more difficult cases such as poor risk or complicated cases, it is possible that instances of electrolyte imbalance can be prevented by using simple estimations of the electrolyte loss (using a table of average values) to guide replacement therapy. This is possible only if one measures the volume of gastrointestinal and urinary losses carefully. Proper balance is more easily maintained if oral intake is essentially stopped during gastric suction.

5. In patients in whom the gastrointestinal suction is more than 1,000 cc. per day, it is probably worthwhile to measure the chloride content daily because of occasional rather wide variation between measured and estimated gastrointestinal chloride losses.

6. In patients with profuse diarrhea, it is helpful to measure the potassium content of the liquid stools.

7. At present the author still measures the sodium, potassium, and chloride balance in critically ill patients with poor cardiac and renal status. Most of these can probably be quite well handled with chloride and water balance alone.

8. Most of all, in handling fluid and electrolyte imbalance problems, one should be guided primarily by

careful judgment and use the balance data only as supplemental information.

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Accident Prevention

The Physician's Role in Driver Licensure, Law Enforcement, Driver Training, and Safety Advances

JOHN A. GROVE, M.D., *Newton*

THE PROBLEM: Traffic accidents today comprise more than 40 per cent of the annual deaths by violence, and for every death there are 57 injured persons. Of the fatalities, from 15 to 20 per cent are killed outright. It is with the 80 to 85 per cent whose deaths are delayed and with the non-fatally injured that our work is concerned.

THE APPROACH: From earliest times when great life destroying and crippling epidemics threatened the human race, medical men have gone to work to solve the problem. The approach has been traditionally threefold, first to find the cause, second to develop means of combating this cause, and third to salvage and repair the damage already done.

To illustrate that we do have a problem, I mention that the year 1955 produced 37,000 fatalities and 2,158,000 injuries due to the motor vehicle. In Kansas there were 592 fatalities and 10,711 injured in 24,054 accidents. That is disgraceful and terrifying. Imagine the furor that would be raised over a smallpox or infantile paralysis epidemic of this magnitude.

My premise from studying these frightful figures is that the medical profession has failed in its duty to the public. It has failed because it has left to others the first two traditional approaches to solution of the problem: the cause and how to combat it. We have been, along with 160 million other Americans, too complacent, too indifferent to the carnage, too over-

whelmed with the problem of salvage of those flowing into our hospitals, to work out a solution. We must join with those few feeble voices that have been crying out in the gasoline wilderness. It is easy to see why we must join, for 1955 produced a 6½ per cent increase over 1954, and 1956 is already more than 10 per cent over 1955. We must join in or be overwhelmed.

Things have been done, yes. The year 1955 saw

The safety problem has become so acute that the medical profession can no longer apply itself only to the care of patients having been involved in accidents. The profession must find the cause and devise ways of correction. A course of action is suggested.

safety in the news, with manufacturers building safety features into automobiles, engineers building even better roads, all media of communications broadcasting slogans of care and safety . . . and what happened? The motoring public with indifference and utter unconcern produced the greatest number of casualties in history.

THE SOLUTION: What can we as medical men do, and what are our responsibilities? If we are to be

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a positive force, we must begin our work at the county medical society level; we must start educating the public, and we must lobby our respective legislatures as they have never been lobbied before to secure the following:

1. *Better Standards of Driver Licensure*

Fletcher Woodward, in an article recently published in *Clinical Orthopedics*, states, "The present day medical standards of driver licensure are confused and chaotic but considering the lack of medical interest in the problem up to this date, it is remarkable that they have done as well as they have."

We need, in Kansas, a complete revision of our driver licensure law. As it presently stands, it is antiquated, geared to 1915 traffic, full of legal loopholes, and it serves only as a poor excuse for a source of revenue.

The physician must be the key figure in setting up adequate standards of the ability to drive a motor vehicle. We alone have the training necessary to judge when a person is physically and mentally fit to drive. We cannot wait until hue and cry from the public forces the legislature into a course of action that would descend upon us without our counsel and guidance and for which we would have only ourselves to blame.

The late Dr. Lawrence Selling wrote extensively on factors represented in the automobile accident problem and, as quoted by Woodward, concluded that physical, mental, and eye disorders were the most important and that, in general, traffic law violators committed their offences because of (1) faulty driving habits, (2) ignorance of traffic laws, (3) poor physical condition, (4) inferior intelligence, (5) mental disease, (6) psychopathic personality, (7) bad driving attitudes, and (8) alcoholism. Since major serious violators are egocentric, inadequate individuals of low intelligence, a question logically arises. How much of a factor are these traits in the 46.5 per cent of deaths that are due to speeding and the 19 per cent of deaths due to driving on the wrong side of the road? Many abnormal people are driving, and the time has now come to decide who may and may not drive.

Licensing boards with medical examiners must be set up. As a guide, the following list from Woodward is suggested, with a notation that many diseases are borderline and must be individualized.

PHYSICAL AND MENTAL DEFECTS NOT SUITABLE FOR DRIVER LICENSURE

A. The Nervous System

1. Narcolepsy
2. Petit mal
3. Grand mal

4. Cerebrovascular accident residual
5. Intercranial disease
6. Mental deficiencies
7. Senility
8. Psychoses
9. Parkinsonism
10. Neuropathies
11. Neuromuscular disorders

B. Special Senses

1. Meniere's syndrome and other vestibular disorders
2. Deficient hearing
3. Visual and ocular muscular defects

C. Cardiovascular

1. Essential hypertension grade 4
2. Carotid sinus hypersensitivity
3. Post coronary thrombosis period
4. Aortic stenosis
5. Severe angina pectoris

D. Miscellaneous

1. Hyperinsulinism, exogenous and endogenous
2. Acute febrile illness
3. Postoperative periods
4. Narcotic addiction
5. Alcoholism

E. Physical Conditions

1. Amputations
2. Paralyses
3. Advancing age (over 65, annual examinations)
4. Deformities
5. Prostheses, plaster casts

F. Drugs

1. Alcohol
2. Carbon Monoxide
3. Sedatives
4. Narcotics
5. Anti-convulsive drugs
6. Vasodilating drugs
7. Anti-histamines

One further thing in this category is of no small value. Take a little time in your busy schedule to acquaint your own patients with their ability to drive. Loss of ability to drive often slips up on a person so insidiously that he is not aware of it, and even the individual's family is unaware of it or is overruled by the head of a family.

If we, as medical men, could get just this one step of an adequate driver license law enacted, we would have gained tremendously on our problem.

2. *Stringent Law Enforcement by Police and Courts*

Recently, in a magazine article, the governor of Connecticut made this statement, "We have learned an ironic thing. People will not slow down to save their lives but they will slow down to save their driver's license." More than 80 per cent of all casualties in 1955 occurred in accidents where there was

some violation of the driving law. In Connecticut, they reduced fatalities by 15 per cent while the national average was rising by $6\frac{1}{2}$ per cent by a campaign based on the simple premise that in their state 99 of 128 deaths were attributed directly to speeding. A person's chance of being killed is twice as great at 65 miles per hour, so they set their top limit at 55 miles per hour. They then set up stringent laws suspending the license of every convicted speeder for a minimum of 30 days. Second offenders got a minimum of 60 days, and third offenders were suspended indefinitely. After 90 days, a third offender may apply for a reinstatement. They made the law stick, and the backbone of its effectiveness lies in the statement, "There will be no exceptions." The results were immediate and gratifying.

Kansas, my lawyer friends tell me, is badly in need of uniform traffic laws covering both urban and rural areas. The means of handling arrested offenders by the courts needs a thorough overhauling. Most of all, the example of Connecticut in "no exceptions" for violation of the law is a severe but necessary step to be taken.

3. Proper Training of All Drivers

In the transition from the horse and buggy to the motor car, not much driver training was necessary. America graduated from two reins to three push pedals, a spark and gas lever, and not much to worry about on the road. But right there was the origin of something that has made many a citizen a statistic. Our children face a far different situation. True, it is simpler to start a car, but from there on it is a different world. We need to start driver training early and make having had that training a prerequisite to obtaining a driver's license.

In many cities and towns, driver training is started in pre-school and elementary ages by means of Kiddie Safety Programs. In these programs children are taught by doing and acting out in miniature cars how to observe traffic signals and signs and also how to act as pedestrians. Classroom instructions are given in elementary schools by regular teachers as well as safety officials and volunteer individuals. The final school program is one that should be adapted by state law—driver education in all high schools. It is here that behind-the-wheel instruction is taught. This education should be financed by the state and could be paid from drivers' license fees. A driver's license from Kansas has reciprocity in all states. Its cost is minimal. Consider what it would cost an individual to hunt ducks in every state. Driving is probably more important than hunting, and with only a minimal increase in the cost of the license fee, thorough training in driving could be taught to all.

4. Advancement of Safety Features

Under this heading fall a number of important programs which deserve our support. The first of these is the highway program of the state. From a strictly non-political view, the engineering and building of highways is of great importance in preventing vehicle casualties. Much research and exhaustive study are necessary to construct a good highway. The factors of access roads, crossings, curves, intersections, traffic lights, pedestrian crossings, safety islands, lighting, and a multitude of other important features must be incorporated. In spite of the brilliant work of our engineers, the highway program is about 20 years behind where it should be because of tight budgets, politics, the inability of cities and towns to make up their minds on the question of through-the-town or bypass, the advancing population, and increased horsepower. This must be corrected.

Because of pressure placed upon them, a few motor car manufacturers last year began to install safety features as optional equipment. Cornell University Medical School established an automotive crash injury research laboratory and through its research advocated seat belts, safety door latches, recessed steering wheels, padded instrument panels, and other features. The real proof is now being gathered as injured and uninjured persons who have been in crashes are studied by this group. They will soon be publishing figures which show that these features are lifesaving.

In the meantime, the safety laboratories of the motor car industry are hard at work trying to incorporate safety features that will not prove too costly and can be incorporated into the style and trend of motor design. They have come up with safety glass, steel tops, better brakes, recessed controls, better lights, and, ironically, increased horsepower beyond what our roads today will handle. Unfortunately, it is true that the dollar sign outweighs the safety sign in the manufacture of the motor car, and only through the pressure of public opinion and the willingness of the buying public to purchase cars with full safety features will motor car manufacturers go all the way on safety.

Again, the medical profession has the facts, and it must put them before the public and practice them constantly if prevention is to be achieved.

I would like to present two case reports of head-on crashes that have occurred within the last month as proof of what safety features can do for saving lives and reducing injuries. The first was a head-on crash between a semi-trailer loaded with cattle and a 1956 model car. The motor car was equipped with safety belts, recessed steering wheel, and padded dash. It was traveling at a speed of 70 miles per hour. The semi-trailer was traveling at 20 miles per hour preparing to turn off the highway. In the front seat of

the motor car were a man and his wife, and in the rear seat, lying down and unstrapped, was a mother-in-law. The driver was uninjured except for bruises of a minor nature; his wife, because of cave-in of the door on her side, had some rather severe contusions of the chest, one fractured rib, and severe shock which subsided after a stomach tube was passed to relieve an acute dilatation of the stomach. The mother-in-law, unstrapped, flew around in the car and suffered considerable shock. Fate was unkind, and she later died of irreversible shock. The motor car was completely demolished, the result junk.

Contrast that with another head-on crash between a light farm truck and a 1955 motor car. There were no safety features except that both were fairly recent models. The speeds were excessive. A boy in the farm truck had multiple lacerations, shock, a posterior dislocation of the left hip with a large fragment of the posterior rim of the acetabulum carried away by the dislocation. A girl in the car was thrown out and killed instantly. The driver of the car had deep shock, a double fracture of the left ulna, a fracture of the left femur mid-third, and a complete dislocation of the right talus from the navicular and calcaneus, irreducible manually because of the wrapping of the tendon of the tibialis anticus about the neck of the talus.

There were two crashes where the forces of acceleration and deceleration were about equal with two completely different results on the human cargo within the vehicles. The only factors differing in these crashes were those of safety features of crash belts and pads, collapsible steering wheel, and safety locks on the doors.

One of the most unhappy men I have seen in a long time grunted out to me recently in an emergency room, "Yes, I have safety belts, but they weren't fastened."

The Salvage

We, as medical men, can take some slight bows when we view our work in first aid, transportation,

and care of the victims of vehicle crashes. Only one in 58 dies, a mortality rate comparable with the early years of operation for appendicitis.

There are several points on which we are getting only a poor rating, and I wish to stress a number of these. In first aid, we show a remarkable indifference to the lessons which are relearned during each war. Shock starts from the instant of injury. Anything that will keep that shock from growing more severe is good treatment. Such simple things as splinting a fractured femur can save a pint of blood from escaping into the tissues; yet in Kansas, we are seldom greeted in an emergency room with a splinted fracture.

The fact that only 15 per cent of the victims are killed outright and 85 per cent die later deserves critical study. How many could be saved through efficient first aid? There is enough first aid education in lay groups, particularly among truck and bus drivers, police and ambulance attendants, so the answer is probably that the methods they know are too complicated. They can and should be simplified so they will be used. Some philanthropist would give mankind a terrific boost if he would place simple splints in the cabs of every major truck line. They would be used, for there is seldom an accident that happens anywhere on our highways that is not on a route used by some truck.

The second sore spot on which the probing finger should be placed is in our hospital emergency rooms. The volume of injuries no longer will let us apply by masterful inactivity the old rule of thumb, that the young man just out of medical school will learn by experience. Young men man our emergency rooms. They need that experience when they start to practice. Teach our medical students, interns, and residents what trauma is and how to handle it, and we will then see a rise in the quality of emergency room care and its inevitable companion, the reduction of mortality.

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Nothing comes by chance, for in all the wide universe there is absolutely no such thing as chance. We bring whatever comes. Are we not satisfied with effects, the results? The thing then to do is to change the causes.

—*Ralph Waldo Trine*

Atherosclerosis

A Metabolic Fault which May Have Significant Etiological Relationship

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Almost in self defense one is inclined to do considerable thinking about the possible causes and, more to the point, the prevention or reversal of atherosclerosis. We are impressed with the concomitance of hyperlipemia in states in which there is hardening of the arteries of the fatty intimal type—and yet we wonder if there is not too much emphasis on the study of lipids in the blood and too little thought about an actual underlying mechanism of lipid metabolism.

Perhaps there is some analogy between the hyperglycemia seen in diabetes mellitus and the hyperlipemia seen in diseases of arterial insufficiency. In both perhaps there should be less determination to normalize the elevated sugar or fat, as the case may be, and more consideration to correcting the underlying defect. We like to think, for example, of hyperglycemia as simply a sign of a disease in which the physiologic ramifications are just beginning to be unraveled. We are beginning to wonder if the pathologic physiology of hyperlipemia cannot be organized in a similar fashion and if, perhaps, it actually may simply be a part of the spectrum of diabetes that is much broader than we have formerly thought.

For example, it has been noted for some time that a fasting blood sugar in patients with acute myocardial infarction will be elevated in a large percentage of cases. This has been explained by saying that a stress reaction, about which so much has been written in recent years, simply manifests itself in one direction by hyperglycemia. We are beginning to wonder if, in actuality, the hyperglycemia found in acute coronary disease does not indicate that the patient is actually mildly diabetic and that the trauma of infarction has made this incipient disease evident.

This idea gains credence when one realizes that myocardial infarction in pre-menopausal women is uncommon—but in diabetic women the frequency of recognizable coronary or otherwise atherosclerotic disease approaches that found in males. Likewise when one sees a patient with severe arteriosclerosis obliterans and takes the trouble to do a glucose tolerance test, one can often find a mild diabetes hitherto unrecognized. In other words, we believe that perhaps diabetes and hyperlipemia and atherosclerosis have a common metabolic fault—although not exactly of

the same type—and that they simply represent variations or positions in a common spectrum.

A further line of clinical evidence is seen in the reported cases of hyperlipemia with acute pancreatitis, albeit the reasoning as propounded by Klatskin is the exact opposite proposed in this paper. In addition, the hyperlipemia and fatty liver in uncontrolled diabetes are so commonplace as to have been ignored in the limelight flooding other aspects of arterial disease. Gofman has shown the reversibility of the abnormal lipids found in untreated diabetes by giving insulin alone.

Nineteen of 25 patients convalescing from acute myocardial infarction were given glucose tolerance tests which indicated incipient diabetes. Would insulin have a prophylactic effect in such cases? Would glucose tolerance tests indicate individuals unduly susceptible to atherosclerosis?

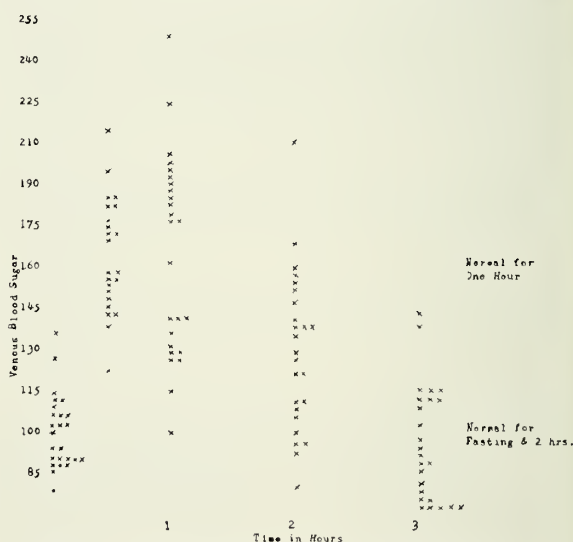


Figure 1. Single glucose tolerance tests done on 25 patients who have recovered from a myocardial infarction. The Somogyi method using 100 gm. of oral glucose was used.

To test this thesis we have done glucose tolerance tests using the Somogyi method and 100 grams of glucose orally in patients in our private practice who have had myocardial infarctions—and in whom there has been a recovery. The test is done three or four months after the acute illness when the patient is ambulatory and feeling well. We have also tested a number of apparently normal controls to check the method. The Somogyi procedure for true blood sugar, using venous blood and a three-hour oral glucose tolerance test, is felt to be positive for diabetes if the fasting blood sugar or the two-hour blood sugar is above 100 mg. per cent. A one-hour blood sugar above 160 mg. per cent is suggestive but not diagnostic.

Figure 1 shows the scattergraph of the glucose tolerance tests for the patients with myocardial infarction, and Figure 2 shows the scattergraph for the controls. There were 17 men in the patient group ranging in age from 40 to 68 years. There were eight women ranging in age from 50 to 69. In the control group there were four men and eight women, the ages ranging from 25 to 55 years.

None of the patients studied were known to be diabetic prior to this examination, and there were no positive family histories for diabetes except in one person in the myocardial infarct group. Four patients in the post-infarction group showed sugar in the urine at some time during the glucose tolerance test. Of course it is probable with the high incidence of atherosclerosis in diabetes that we will pick up a few cases of unsuspected diabetes in a study of this type, but Figure 1 shows clearly that the incidence of abnormal curves is markedly higher than one would expect

from the incidence of diabetes mellitus as it is now designated. In fact 19 of the total patients studied could be judged diabetic by the above criteria.

A study such as this, if it continues to show as definite results as appear now, has several important corollaries. The first, of course, is whether or not patients with myocardial infarction should have small doses of insulin in the hope of reversing the abnormal lipid spectrum that they have been shown to have.

Another question might concern men of 40 who have not had a myocardial infarction but who are considered to be of the type subject to it and who have had positive tests. Should they be given insulin as a preventive measure?

We were much interested to see that Futcher reported recently that out of 180 subjects 40 years old and over, 31 per cent had diabetic type glucose tolerance tests. We would conclude that these are those with the evil eye of atherosclerosis glaring in their future.

We would like to do a study of this type correlating the "Gofman Type" lipoproteins with the glucose tolerance test and then put the abnormal reactors on insulin to see if the lipid spectrum as described by the ultracentrifuge could be reversed. So far a study of this type has not been practical. Secondly, it is of great interest that recently hypercholesterolemia has been described following damage to the islets of Langerhans with cobaltous chloride which is given to destroy the alpha cells. If it could be shown that a hormone such as glucagon, which is presumed to be produced by the alpha cells of the islets, is also involved in cholesterol metabolism, the hypothesis of this paper would be considerably strengthened.

With the thought that hyperlipemia and diabetes are rather intimately related, we attempted giving insulin to a patient with familial hyperlipemia in doses as high as 20 units of NPH daily. Unfortunately the blood lipid, at least as measured by cholesterol, which in this case averaged about 800 milligrams per cent, was unaltered. This patient, a woman, happened to have mild diabetes which had been previously untreated. One wonders if an impure extract of the pancreas could not be tried with the thought that the blood lipids are controlled by an analogous hormone to insulin. Dragstedt, of course, has already tested this thesis in dogs with "lipocaic." The exact significance of this latter work awaits elucidation.

SUMMARY

A series of glucose tolerance tests has been done on a group of patients after they have convalesced from an acute myocardial infarction. In 19 of these 25 patients the glucose tolerance test indicated incipient diabetes. It is felt that the diabetic state is much broader than has been thought and that most patients

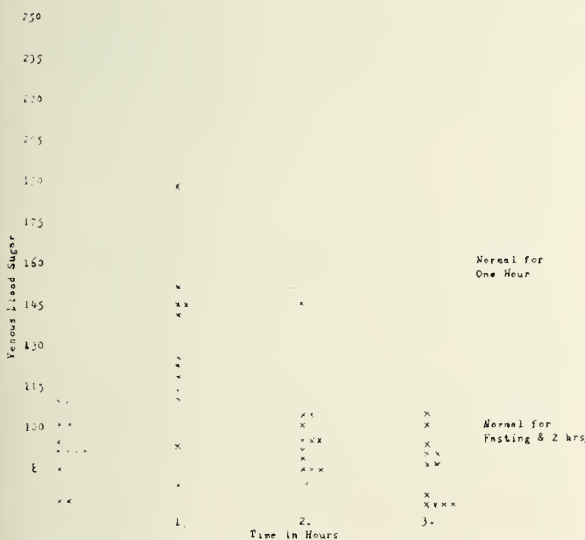


Figure 2. Single glucose tolerance tests done on 11 apparently normal persons clinically free of atherosclerosis. The Somogyi method using 100 gm. of oral glucose was used.

with premature atherosclerosis are in effect suffering from a metabolic defect of unknown nature—but one which is part of the spectrum of diabetes on the one hand, and “pure” hyperlipemia on the other. The question is raised whether or not insulin might have a prophylactic effect in these cases and also whether or not the glucose tolerance test might not be a simple method to pick out individuals who are unduly susceptible to atherosclerosis.

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Hearing Tests

Evaluation of Present Measurements of Auditory Acuity

C. P. GOETZINGER, Ph.D., *Kansas City*

Accurate measurement of hearing, as available today, did not become a reality until the invention of the vacuum tube pure tone audiometer. While several methods for assessing auditory acuity were common prior to its development, none afforded sufficiently stable characteristics for adequate standardization. Thus, such time honored tests as the watch tick, tuning forks, whispered and spoken voice, etc., were inherently subject to far too many variables for precise evaluation of hearing sensitivity and the exploration of frequency range.

Although the electronic pure tone audiometer appeared in this country in 1921, it was not until 1939 that adequate norms had been established to evaluate average normal hearing. Earlier attempts to set up threshold standards, based upon laboratory studies, had proved entirely too severe, with the result that an unreasonable number of individuals showed hearing losses when tested on audiometers calibrated to these standards. The Public Health Survey, con-

ducted by Beasley in 1935-1936, ultimately provided the data upon which all present day commercial pure tone audiometers are calibrated. The threshold standard for average normal hearing was set forth in 1939, and since that time it has been shown to be an ex-

Speech audiometry, developed during World War II, supplements information obtained by the pure tone technique, each method contributing uniquely to the understanding of a given hearing loss. In recent years the psychogalvanic skin response has been used to measure hearing acuity. Research will be required to determine its clinical worth.

ceedingly useful reference level both in this country and in Europe.

The outbreak of World War II provided the impetus for a vast amount of research in the field of

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communications. A subject of prime importance pertained to the transmission and reception of signals (speech and code) under heavy noise conditions. Perforce, thousands of English words were studied with reference to intelligibility, carrying power, etc. As a result of this work, speech tests were developed which subsequently proved effective in the evaluation of hearing loss. In brief, it was possible now to measure directly not only auditory acuity for speech but also how well the elements of speech could be understood at supra-threshold levels. The latter type of test was particularly significant since a tool was at last available to assess hearing, not at threshold, but at a level at which listening is usually carried on. Hence, tests were provided for measuring hearing in the practical dimension, i.e., utilizing the elements of language, or words.

The advent of speech audiometry, or testing with words, has in no way detracted from the pure tone audiometric test. Either method when employed alone contributes uniquely to the understanding of a particular hearing problem. When, however, one is used in conjunction with the other, a more complete picture of an individual's ability to hear is available.

In all of the above discussed tests of hearing, a response is required of the individual. In other words, he is expected to raise his finger, press a button, or repeat a word, depending upon the nature of the signal. Many ingenious methods, such as the Peep Show, have been worked out to elicit responses from children. With infants and very young children who are unable to respond in the appropriate manner, attention is focused on a change in behavior such as

the rolling of the head or eyes to the source of stimuli. The relative inadequacy of determining threshold in the latter cases has prompted some investigators to attempt to devise so-called objective techniques for measuring hearing acuity in which the requirement of an overt response would be eliminated.

The search for a method to measure threshold for hearing objectively resulted in the development of psychogalvanic skin audiometry. In short, auditory sensitivity is determined by a decrease in the electrical resistance of the skin when a tone is sounded. Two electrodes, connected to appropriate recording equipment, are placed on certain parts of the body. A mild electric shock capable of evoking a decrease in skin resistance is paired with a pure tone, until the tone by itself initiates the desired response.

During the past six or seven years a great deal of literature both pro and con has appeared about this particular test. Proponents of the method feel that they have an accurate method of determining hearing ability which does not require active individual participation. Unfortunately, research with the method has revealed a number of drawbacks which must be overcome before the test can be used as an accurate clinical tool. At present research in the psychogalvanic skin response test is being conducted at the University of Pittsburgh, C.I.D., etc. Results to date would seem to indicate the need for further research before the method can be used clinically on a wide-spread scale.

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In a competitive world, life and freedom must be backed by strength. But survival has a time dimension which says that power consists of more than strength of arms. Short-term survival may depend on the knowledge of nuclear physicists and the performance of supersonic aircraft, but long-term survival depends alone on the character of man. Our scientific, economic and military accomplishments are rooted in the human quality which produces them. In the last analysis, all of our knowledge, all of our action, all of our progress, succeed or fail according to their effect on the human body, mind and spirit.

—Charles A. Lindbergh



Hydrochloride
Tetracycline HCl Lederle

EDITORIAL COMMENT

Television at State Meeting

The state meeting will be held at Wichita, May 5-9, 1957. There will be a number of innovations, among which is the first closed circuit live television program in the history of the Kansas Medical Society.

A one-hour program will be televised live out of Chicago on Monday afternoon, May 6. This may be viewed in the East Room of the Allis Hotel in Wichita. The program is on mental health and will consist of a panel of experts examining and interviewing a series of patients. Following their appearance the panel will discuss the patients' conditions, and questions may be asked locally from Wichita which will be heard by the panel and answered directly.

Smith, Kline and French Laboratories are bringing this innovation to the 98th annual session of the Kansas Medical Society and will carry the identical program at the same time to four other state meetings that are in session in different parts of the United States. The other states are Oklahoma, Louisiana, South Carolina, and Florida. The program will be blocked out of home receivers and will not be carried in other parts of the country.

It is hoped that members of the Kansas Medical Society will set aside one hour on Monday afternoon for this special program. More detailed announcements will be made as final plans are completed.

A.M.E.F. Contributions Increased

An encouraging increase in contributions during 1956 was reported recently by the American Medical Education Foundation at the end of its fifth year of operation. Receipts for the year, \$1,072,717, represented a 41 per cent gain over contributions in 1955. If a grant of \$125,000 from the American Medical Association is excluded from the accounting, the increase represents 25.1 per cent.

The A.M.A. grant of \$125,000 was in addition to a gift of \$100,000 early in the year. It was voted by the A.M.A. House of Delegates in December after Dr. Gunnar Gundersen, chairman of the Board of Trustees, presented the following report:

"The Board of Directors of the American Medical Education Foundation has informed the Board of Trustees that this year, 1956, the funds received by the Foundation will be sent direct to the medical schools instead of through the National Fund for Medical Education. The reasons for this action are as follows:

"In 1951 when the Foundation was created, it was felt that the funds of the Foundation would serve as a stimulus to further contributions from all sources. Until 1955 the funds from the Foundation totaled more than half of the amount donated to the schools by the National Fund. Now the amount is less than half, so the need of the stimulus of the Foundation funds no longer exists. A completely separate listing and mode of donation will now serve to stimulate the doctors to contribute to their own organization more than if the funds continue to be channelled through another organization. Better relationships can be established with the alumni funds which deal only in earmarked money. The Fund does not solicit earmarked money, while the Foundation does.

"However, one complicating factor has arisen and that is the matching funds being donated this year to the National Fund by the Ford Foundation. Since the funds donated direct to the schools by the Foundation will not be matched by the Ford Foundation, the medical schools would receive approximately \$120,000 less than under the old system.

"Both the Foundation directors and the Board of Trustees feel that the new system will in the long run be of benefit to the medical schools in that both the Foundation and the Fund will be able to raise more money. This will, of course, take time. Hence, for this year, so that the schools will not be penalized by the new system, the Board of Trustees has appropriated an additional \$125,000 for the American Medical Education Foundation to make up for the funds that the schools would have received through the matching grants of the Ford Foundation. This amount is in addition to the \$100,000 previously appropriated. Also, the House should bear in mind that the American Medical Association underwrites all the expenses of the Foundation, both in its fund drives and its educational programs. This expense for 1956 approximates \$118,000, so that the total contribution made by the American Medical Association to the American Medical Education Foundation for the year will actually be \$343,000. There is nothing more important than the support of our medical schools in order to keep them free. The Board of Trustees is happy to do all it can to assist the program.

"We are deeply indebted to the doctors who have generously supported the Foundation, and we are also equally indebted, perhaps more, to the industries and individuals that have supported the unselfish efforts of the officers and directors of the National Fund. Both organizations must prosper, and we are confident that both will receive the necessary support."

Kansas physicians, both individually and collec-

tively, made larger contributions in 1956 than in the past. For the first time the Kansas Medical Society as an organization made a gift, \$5,085.14, in accordance with action taken by the House of Delegates at its meeting in Topeka last May. The Society's contribution, from two sources, was marked for use at the University of Kansas School of Medicine.

One account, containing \$1,535, represented contributions from members of the Society for the Student Union Fund. In keeping with the objective of the donors, this money was sent to the Student Union Fund through the A.M.E.F.

The second contribution, \$3,550.14, represents one-half the amount remaining in the Society's Graduate Education Fund. This money was accumulated during the World War II period when physicians who remained at home made contributions as a gesture of appreciation to those in military service. Society members who served in the armed forces and enrolled for graduate education when they returned to civilian life received the benefits of this fund, and a total of \$7,100.28 was not so distributed. As directed by the House of Delegates last spring, one-half this amount was sent to the A.M.E.F. with a stipulation that it be forwarded to the University of Kansas School of Medicine and used for a program fostering some form of graduate education.

A new year is now beginning, and the need for contributions continues. Kansas physicians, more generous in 1956 than in former years, are urged to participate in the program again in 1957 with even larger gifts for the continuation of medical education as we now know it.

Privileged Information

It is said that physicians of a former era practiced for many years without ever having had occasion to learn details of the legal aspects of medicine. Not so today. The wise physician of 1957 is informed on laws pertaining to his profession and adheres conscientiously to legal and ethical standards.

Because he wants to know decisions and opinions concerning professional actions, the Kansas physician will be interested in a statement recently made by the Kansas Medical Society attorney in reply to this question: "Does height, weight, color of hair and color of eyes, and other identifying data, this information acquired in process of a physical examination by a physician, come under the category of confidential (privileged) information?"

The Kansas statutes pertaining to the incompetency of designated persons to testify read as follows: "Sixth. A physician or surgeon concerning any com-

munication made to him by his patient with reference to any physical or supposed physical disease, defect, or injury, or the time, manner, or circumstances under which the ailment was incurred, or concerning any knowledge obtained by a personal examination of such patient, without the consent of the patient."

The attorney develops the point by adding, "We find no Kansas case passing directly upon the point. However, you will note that the Kansas statute renders a physician incompetent to testify concerning any knowledge obtained by a personal examination of any such patient."

"The Supreme Court of Kansas has taken the position that our statute on privileged communications does not work a general disqualification of a physician to testify. It limits his incompetency as a witness to information acquired as a result, and in the line of, professional employment or duties in the treatment of a patient. A proper examination is an incident of treatment.

"It is our opinion that a physician should take the position that height, weight, color of hair, color of eyes, and other identifying data, obtained by the physician in the process of an examination of a patient by a physician, is privileged information and should not be divulged by the physician without the knowledge and consent of the patient. This is especially true until the Kansas court has occasion to pass squarely upon this question.

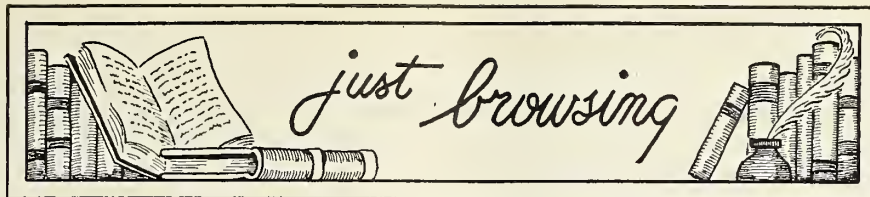
"We recognize that this may appear to be a strained construction of our statute but we attach significance to that portion of the statute concerning any knowledge obtained by a personal examination, and it seems to us that the height, weight, color of hair, color of eyes, and other identifying data would be obtained by the physician as a result of the examination."

Heads Section of Orthopedic Surgery

Dr. Leonard F. Peltier has been named professor of surgery and head of the section of orthopedic surgery at the University of Kansas Medical Center. His appointment became effective January 1.

Dr. Peltier, who came to Kansas from a position as associate professor and acting head of the division of orthopedic surgery at the University of Minnesota, received his medical degree from that school in 1944 and a Ph.D. in surgery in 1951. He is a diplomate of the American Board of Surgery and of the American Board of Orthopedic Surgery and is a fellow of the American College of Surgeons.

He fills a vacancy at the Kansas school occasioned by the death of Dr. James B. Weaver last April.



Abraham Colles, one of the greatest of Irish surgeons, wrote comparatively few papers, but through them made such significant contributions that his name is familiar to all students of medicine. He combined his surgery with an exceptional interest and ability in the study of anatomy and wrote a treatise on surgical anatomy in which is included the description of the perineal fascia which now bears his name.

His original paper "On the Fracture of the Carpal Extremity of the Radius," published in 1814, is another of those rare classics which is an example of brevity and completeness. It contains only 1,528 words, yet describes the confusing picture which led him to investigate, the pitfalls he encountered, the means of his reaching definite diagnosis, and an effective treatment.

"The injury to which I wish to direct the attention of surgeons, has not, as far as I know, been described by any author; indeed, the form of the carpal extremity of the radius would rather incline us to question its being liable to fracture. The absence of crepitus and of other common symptoms of fracture, together with the swelling which instantly arises in this, as in other injuries of the wrist, render the difficulty of ascertaining the real nature of the case very considerable.

"This fracture takes place at about an inch and a half above the carpal extremity of the radius, and exhibits the following appearances.

"The posterior surface of the limb presents a considerable deformity; for a depression is seen in the forearm, about an inch and a half above the end of this bone, while a considerable swelling occupies the wrist and the metacarpus. Indeed the carpus and base of metacarpus appear to be thrown backward so much, as on first view to excite a suspicion that the carpus has been dislocated forward.

"On viewing the anterior surface of the limb, we observe a considerable fulness, as if caused by the flexor tendons being thrown forward. The fulness extends upwards to about one-third of the length of the fore-arm, and terminates below at the upper edge of the annular ligament of the wrist. The extremity of the ulna is seen projecting towards the palm and inner edge of the limb; the degree, however, in which this projection takes place, is different in different instances. . . .

"If the surgeon lock his hand in that of the patient's, and make extension, even with a moderate force, he restores the limb to its natural form; but the distortion of the limb instantly

returns on the extension being removed. Should the facility with which a moderate extension restores the limb to its form, induce the practitioner to treat this as a case of sprain, he will find, after a lapse of time sufficient for the removal of similar swellings, the deformity undiminished. Or, should he mistake the case for a dislocation of the wrist, and attempt to retain the parts in situ by tight bandages and splints, the pain caused by the pressure on the back of the wrist will force him to unbind them in a few hours; and if they be applied more loosely he will find, at the expiration of a few weeks, that the deformity still exists in its fullest extent, and that it is now no longer to be removed by making extension of the limb. . . ."

Follows his concise description of the maneuver which led to the diagnosis—"Let the surgeon apply the fingers of one hand to the seat of the suspected fracture, and, locking the other hand in that of the patient, make a moderate extension, until he observes the limb restored to its natural form. As soon as this is effected, let him move the patient's hand backward and forward; and he will, at every such attempt, be sensible of a yielding of the fractured ends of the bone, and this to such a degree as must remove all doubt from his mind. . . ."

"It is obvious that, in the treatment of this fracture, our attention should be principally directed to guard against the carpal end of the radius being drawn backwards. For this purpose, while assistants hold the limb in a middle state between pronation and supination, let a thick and firm compress be applied transversely on the anterior surface of the limb, at the seat of fracture, taking care that it shall not press on the ulna; let this be bound on firmly with a roller, and then let a tin splint, formed to the shape of the arm, be applied to both its anterior and posterior surfaces. In cases where the end of the ulna has appeared much displaced, I have laid a very narrow wooden splint along the naked side of this bone. . . . The cases treated on this plan have all recovered without the smallest defect or deformity of the limb, in the ordinary time for the cure of fractures.

"I cannot conclude these observations without remarking, that were my opinion to be drawn from these cases only which have occurred to me, I should consider this as by far the most common injury to which the wrist or carpal extremities of the radius and ulna are exposed. . . ."—O.R.C.

Tumor Conference

Myasthenia Gravis and the Thymus Gland

Edited by PETER RASMUSSEN, M.D.

Dr. Stowell (Moderator): Mr. Benage, would you tell us about this unusual and interesting case?

Mr. Benage: This 34-year-old unmarried white man was admitted to this hospital on September 4, 1956, with the chief complaint of generalized weakness. His present disease seemed to begin in May of 1955 when he first noticed weakness of certain of his skeletal muscles, along with difficulty in chewing and swallowing his food toward the end of a meal. He also had difficulty in carrying on a prolonged conversation, and toward the end of the day he had drooping of his eyelids.

He saw a physician in the early summer of 1955. At this time his disease was diagnosed as myasthenia gravis and he was placed on Mestinon therapy. For the next year he seemed to improve under this treatment. However, in July of 1956 his symptoms became progressively worse, and he seemed to be developing increasing tolerance to his medication. He saw another physician at this time and was referred here.

His chief physical findings on admission were ptosis of the eyelids, mainly the right, weakness in the upper extremities, and slightly hyperactive reflexes bilaterally.

The main laboratory finding was the x-ray of the chest which revealed a mediastinal shadow approximately 6 by 3 cm. This was thought to be a tumor of thymic origin.

Dr. Stowell: Dr. Goertz, would you tell us about the roentgenograms, please?

Dr. Goertz: The chief finding is the anterior mediastinal mass which shows calcification. Because of a clinical history of myasthenia gravis, we were alerted for something in the thymus. No one in the radiology department, however, was aware of the occurrence of calcification in the thymus, so we included in the differential diagnosis a dermoid containing possible thymic tissue. The mass cannot be seen well on the PA projection, but it can be seen nicely on the lateral view (Figure 1). Because we were interested in knowing whether the calcification was entirely peripheral, planograms were done. The

anteroposterior planograms reveal much of the mass to be to the right of the spinal column. In a lateral planogram most of the calcification is peripheral.

Dr. Stowell: What was the subsequent course of the patient?

Mr. Benage: He was advised to have the tumor removed, and on September 12, 1956, the thymic mass was excised along with surrounding fatty tissue with the intent that any adjacent accessory thymic tissue would also be removed.

His course was fairly good the first two postoperative days. However, on the third day he became increasingly apprehensive, dyspneic, and somewhat cyanotic. A thoracentesis was done but no fluid or air was found. He was sent to the recovery room for intensive therapy but remained in respiratory distress. He was placed in a Drinker respirator. For the next 36 hours his course was one of generally intermittent apprehension and shortness of breath. He had considerable nasopharyngeal mucus secretion, which was removed by nasal suction. He also had continuous cyanosis of the toenails and fingernails.

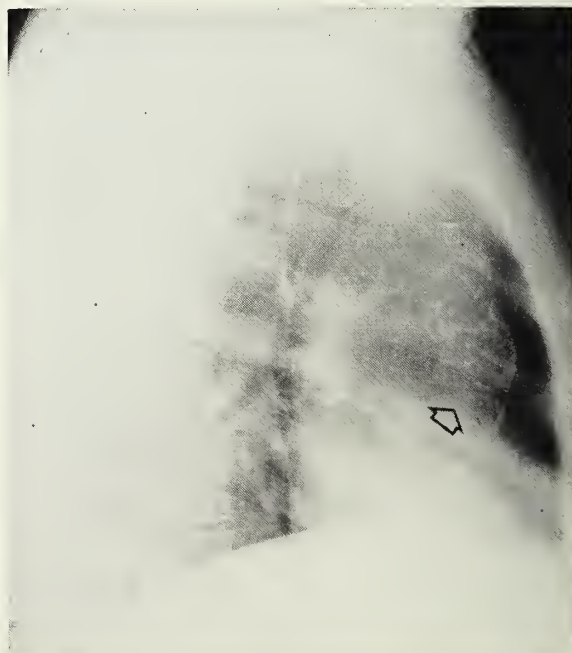


Figure 1. Lateral roentgenogram of the chest with an arrow indicating the calcified mass in the anterior mediastinum.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Rasmussen is a Trainee of the National Cancer Institute.

On the evening of the fourth postoperative day the patient suddenly ceased breathing. Intubation was performed, oxygen was administered, and intracardiac injection with epinephrine was given. The patient did not respond to this therapy, and he was pronounced dead.

Dr. Stowell: Dr. Boley, will you describe the surgical specimen?

Dr. Boley: There was a considerable amount of fatty tissue attached to a disc shaped mass. The mass appeared encapsulated and the capsule was partially calcified, with old necrotic tissue within the capsule. The entire specimen, including the fat, measured 15 by 10 by 3 cm. A contiguous but separate nodule of thymic tissue was also seen outside the calcified area. Sections were taken from both portions.

Dr. Helwig: In the section from the thymic tissue adjacent to the calcification, there is obvious lobulation with a great increase in follicles, which are confined to the medulla. Furthermore the cortex is compressed by this medullary lymphoid hyperplasia.

This is a typical example of thymic hyperplasia as seen in cases of myasthenia gravis. Only about 15 per cent of myasthenia gravis cases, according to Castleman,¹ are associated with thymoma, that is, are actually neoplasias of thymic origin; in the other 85 per cent the thymus is often not enlarged to any significant degree. But of that 85 per cent, about 80 per cent will show this follicular type of lymphoid hyperplasia, in no way different from the normal lymph follicles which we see in Hashimoto's or Basedow's diseases or in lymph nodes with reactive follicular change. It is Castleman's feeling that they do not represent neoplasms in the sense that they are actually new growths, but that they are a response of some specific, unknown stimulus on the thymus gland itself. Seventeen per cent of patients with myasthenia gravis will have a perfectly normal thymus, already having undergone involution consistent with the age of the person.

The amount of follicular hyperplasia we see is not in any way significant as to the severity of the myasthenia gravis. But when the pattern is marked, as it is here, it usually has a better prognosis so far as the subsequent amelioration of the myasthenia is concerned, than in those glands which have a perfectly normal pattern. The whole proliferation is purely lymphoid and the cortex is compressed, as Castleman said, like a cap over the summit of the medulla as seen here; this is brought out vividly with reticulum stains.

Incidentally, Dr. Iverson,² in considering thymomas, actual tumors, feels that those associated with myasthenia gravis have a preponderance of large cells

intermingled with the lymphocytes, but frequently arranged around vessels.

So there does seem to me to be a definite relationship between this type of follicle formation and myasthenia gravis. Just what it is, no one understands.

Wilson and Wilson,³ as well as others, have found in animal thymus gland extracts a substance which will cause, apparently, a transient myasthenic-like syndrome in some animals. Extracts from the thymuses of myasthenic patients also do this. These extracts also potentiate curare.

Dr. Stowell: Dr. Allbritten, will you discuss this case further?

Dr. Allbritten: The preoperative clinical course has been presented. The operation itself seemed to be totally uneventful. Anesthesia was perfectly satisfactory. He was well oxygenated throughout the procedure, and his first two days postoperatively seemed to be uneventful. He was placed on anticholinesterase drugs parenterally immediately postoperatively, and then shifted to oral preparations of these drugs on his second postoperative day. Now, I think this may have been an error, in that he did have intermittent nausea, and we are not sure how much of his oral medication was absorbed. However, he got along well and required no parenteral drug until the evening of the second postoperative day when he again had neostigmine, and on the night of the second postoperative day he had increasing shortness of breath.

By the morning of the third postoperative day he was obviously in trouble. This was secondary to his respiratory muscle weakness and fatigue. At this time he did not appear short of breath. He looked rather placid; he did not have the vigorous respiratory movements that a dyspneic individual ordinarily has, which, of course is exactly what one would expect, for he couldn't make vigorous respiratory movements.

When one listened to his chest it was difficult to hear any parenchymal breath sounds. After a needle was inserted in his chest, to be sure he had no intrathoracic collection of air from the operation, it became obvious he needed assistance in ventilation, and this was instituted. Actually through the afternoon and night of his third postoperative day he seemed to do well in the Drinker respirator. He was not short of breath; he was not cyanotic. The combined movements of his chest and abdominal wall were good, and he seemed to have an adequate air exchange. Through the fourth postoperative day he was allowed out of the respirator intermittently.

In the meantime he had become completely insensitive to any of the anticholinesterase drugs. When he was brought back to the recovery room on the third postoperative day, he was placed on Tensilon intravenously which was ineffective. He did not respond to

prostigmine. These were discontinued because of the unpleasant side effects when he was in the respirator. We thought that perhaps if we could relieve him of any muscular activity through the next day, he would again lose his fatigue and be able to ventilate spontaneously. However, on his fourth day this did not prove to be the case. Apparently there is some difference of opinion at this time, for Dr. Mastio, who saw him that evening, found his color quite good and ventilation seemed to be adequate. However, suddenly, about nine o'clock on the evening of the fourth postoperative day, he died.

I would suspect that this was probably secondary to ventricular fibrillation, although we have no evidence of this except for the sudden death. The only way that I can reconstruct this picture from the clinical evidence is that he probably did have increasing anoxia which was reaching the point of intolerance as far as the ventricular myocardium was concerned. Ventricular fibrillation was probably the terminal episode. Post mortem examination was done.

Dr. Stowell: Dr. Svoboda, can you tell us the results of the autopsy?

Dr. Svoboda: The main pathological findings were in the lungs. These were somewhat heavy, weighing 1040 grams, and were somewhat subcrepitant and rather dark red on cut section. There was a moderate amount of mucus confined mostly to the right lung and right bronchi. The larynx was removed also and there was found to be no obstruction at this point. Microscopic sections confirmed the presence of pulmonary edema, as well as an early acute bronchitis and bronchopneumonia.

Dr. Stowell: Dr. Delp, would you comment on the subject of thymomas in myasthenia gravis? Can you give us an idea of how often you see patients with myasthenia gravis that is related to a thymoma which is definitely demonstrated?

Dr. Delp: I think the statistical data as reported by Dr. Helwig are accurate as to the incidence. I've seen only three patients with thymomas who have had myasthenia gravis. Two of these patients responded beautifully to surgical relief, and one of them responded well to radiation therapy. I think it's discouraging that in the larger series those who actually have thymomas are not relieved nearly so often as those who have simply resection of their non-neoplastic thymus glands.

Another factor which seems to color the results is the sex of the patient. Females have frequently derived better results from the removal of the thymus than have males.

It is interesting to think of this situation, as posed here in this particular patient, in the same light that we consider diabetes because the problem is almost analogous. The problem of handling such patients

either in the myasthenic crisis or in the cholinergic crisis is comparable to the many complications that we have in trying to manipulate the dose of insulin for the patient who is in diabetic acidosis or to correct all the electrolyte imbalances that we are creating by the use of our therapy. Because of their similarities, it is extremely difficult to differentiate between the cholinergic crisis and the true myasthenic crisis. It must be based on good judgment and based upon what the dosage and medication have been in the immediate past.

The cholinergic crisis is caused by overdosage of antimyasthenic drugs resulting in crisis, that is inability to breathe or swallow properly, similar to a myasthenic crisis, such as might be brought on by infection. The symptoms of the cholinergic crisis have been nicely laid down by Dr. Tether⁴ in a recent journal symposium. They are muscarinic as miosis, abdominal cramping, or salivation; nicotinic, with muscle fasciculations, dysphagia, and weakness; and central nervous system in nature with giddiness, confusion, and even convulsions. The muscarinic reactions may be rather transitory in cholinergic crisis, making distinction from myasthenic crisis exceedingly difficult if not impossible, clinically. The anti-myasthenic drug Tensilon has been used to help the differentiation. Muscle fasciculations induced by Tensilon, during a particular crisis, tend to suggest it is cholinergic; with no effect from Tensilon, the crisis is more probably myasthenic.

Another mysterious thing about these people is that they have spontaneous remissions, as did this man. For a period of a week or ten days within the past year, he was completely free of myasthenia gravis. Medication had not a thing to do with it; he just did not have his disease, and he did not take his medicine. This makes most of our explanations concerning the behavior of myasthenia gravis inadequate at present. Indeed, this latter phenomenon has made evaluation of surgical treatment difficult.

Dr. Stowell: Thank you, Dr. Delp. This case presentation has illustrated some aspects of the relationship of myasthenia gravis to the thymus gland, as well as the numerous intrinsic difficulties in treating a person with this infirmity.

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Clinicopathological Conference

Case from the Hertzler Clinic and Hertzler Research Foundation, Halstead

CHARLES POKORNY, M.D., Moderator

Dr. Pokorny: Today we will discuss a disease which is important not only to every surgeon but to the internist and general practitioner as well. This disease is difficult to diagnose and controversial to treat, and in severe forms its mortality is forbidding.

A 51-year-old white female was admitted to Halstead Hospital on July 23, 1955, with a five-hour history of severe abdominal pain which had started suddenly while she was preparing lunch. The pain caused her to sit down, and she became nauseated and vomited. One month before she had had a similar, but less severe, attack of pain. She had never noticed jaundice, diarrhea, black or bloody stools. There was no discomfort in her chest, but she was unable to breathe deeply on account of pain.

Physical examination revealed an obese female in acute abdominal distress. Her temperature was 98.6°, pulse 80 per minute, respirations 30 per minute, and blood pressure 130 systolic and 70 diastolic. The ears, head, neck, and throat appeared normal. The lungs were clear to percussion and on auscultation. Examination of the heart was not contributory. The abdomen was obese, and muscle guarding was present but there was no spasm. The greatest tenderness was noticed around the umbilicus. There was no rebound tenderness, and bowel sounds were present. Pelvic and rectal examination was normal, and the neurologic examination did not reveal anything abnormal.

On admission, the patient's white blood cell count was 12,700 per cu. mm., of which 57 per cent were segmented leucocytes, 31 per cent stab forms. The hemoglobin was 78 per cent, the icteric index was 7.9. Amylase of the blood serum was 464 mg. per 100 cc. X-ray studies of the kidneys did not reveal pathologic findings.

The following day the serum amylase decreased to 246 mg. The patient still had severe pain, and peristaltic waves were audible. At 8:30 a.m. the patient went into shock, the pulse was 150 per minute, and the blood pressure fell to 70 over 60. Morphine was given for pain and the patient was placed in the Trendelenburg position. Blood transfusion was started through the surgically exposed right saphenous vein. In spite of these measures the pulse became unobtainable, the urinary output

poor. Levophed was started and quinidine gluconate was given. However, the patient did not rally from her shock and expired at 8:35 p.m.

Clinical Diagnosis

Dr. Dreese: From the history and physical findings in our case I would exclude mesenteric thrombosis, particularly because there were audible bowel sounds. I would not consider a dissecting aneurysm either, because it should cause more pain in the back or chest. Perforation of a duodenal ulcer is unlikely because there was no abdominal rigidity. The shock, rapid pulse, sudden pain with nausea and vomiting, also the abdominal pain without rigidity, make me think of acute pancreatitis. The high serum amylase favors this diagnosis; however, perforation of a duodenal ulcer in the pancreas might well elevate the amylase values.

Dr. Muck: Would her obesity speak more for pancreatitis and against duodenal ulcer?

Dr. Dreese: Many female ulcer patients I have seen were large and obese. This may be due to the Sippy diet on which they have been placed by their physicians.

Dr. Pokorny: Would the fact that the patient had repeated milder episodes of pain before the last attack speak in favor of acute pancreatitis?

Dr. Dreese: I would think an impacted stone in the ampulla of Vater could best explain in our case the recurring episodes of pain. Cholelithiasis is a common association with pancreatitis, and a stone in the ampulla may very well lead to reflux of bile into the pancreatic duct, activating the pancreatic proenzymes.

Dr. Westfall: On admission the two most likely diagnoses to consider were a perforating duodenal ulcer or acute pancreatitis. We knew from former admissions that this patient had achlorhydria and pernicious anemia. A duodenal ulcer with achlorhydria is, in my experience, extremely rare. The patient also did not have the board-like rigidity which goes with perforation of a gut or stomach. What also impressed me was the history that the last attack started when the patient prepared a meal. A good many cases of acute pancreatitis have their onset when you expect an increased flow of bile. The



Figure 1. Typical case of pancreatitis caused by impacted stone in the ampulla of Vater.

serum amylase test was of course of great help, and after consultation with Dr. Chesky I decided to treat the patient medically. Operation in early stages of acute pancreatitis, in contrast to former times, is not recommended. The purpose of medical treatment is to stop the flow of bile by use of anti-

cholinergic drugs, to relieve pain, and prevent peripheral vascular collapse.

The clinical diagnosis was acute pancreatitis.

Autopsy Findings

Dr. Hellwig: The body was that of an obese white female weighing approximately 175 pounds. There was a scar in her neck from thyroidectomy in 1938. The skin was not jaundiced. When the abdominal cavity was opened, characteristic white spots of fat necrosis on the omental surface confirmed the clinical diagnosis. In the abdominal cavity was about 500 cc. of cloudy, hemorrhagic thin fluid. There was an extensive hemorrhagic edema of the anterior and posterior aspect of the pancreas. The retroperitoneal edema extended to the right renal capsule. The distal half of the pancreas was markedly swollen and softened, and cross section revealed hemorrhagic and whitish necrotic areas. The main pancreatic duct was slightly dilated and opened 1 cm. above the papilla of Vater. In the ampulla of Vater a small dark green faceted calculus was firmly impacted in a diverticulum of the wall. A slightly larger stone was noted 2 cm. above the ampulla in the common duct, which was moderately dilated. Eight faceted stones were seen in the gallbladder.

No abscesses or evidence of cholangitis were noticed in the liver. The stomach had a thin atrophic mucosa with low folds, and it contained bile stained mucus.

The anatomical diagnosis was: acute hemorrhagic pancreatitis; multiple fat necrosis of omentum; hemorrhagic exudate in peritoneal and pleural cavities; cholelithiasis and cholecystitis; mixed stones

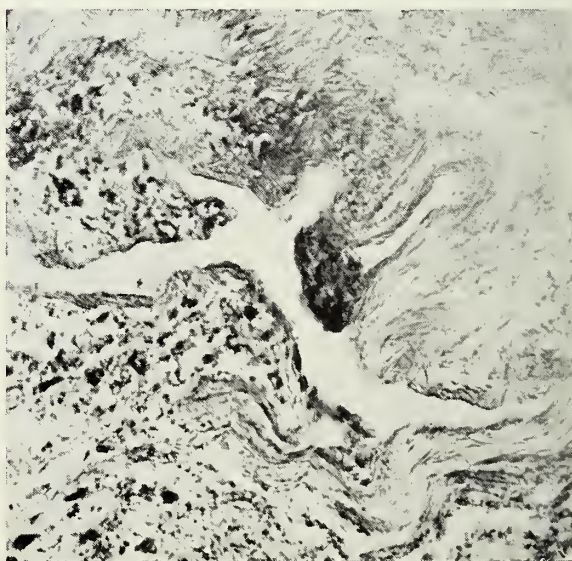
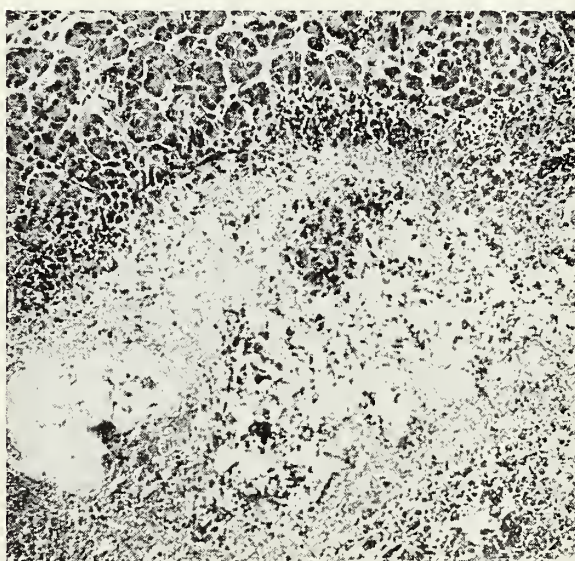
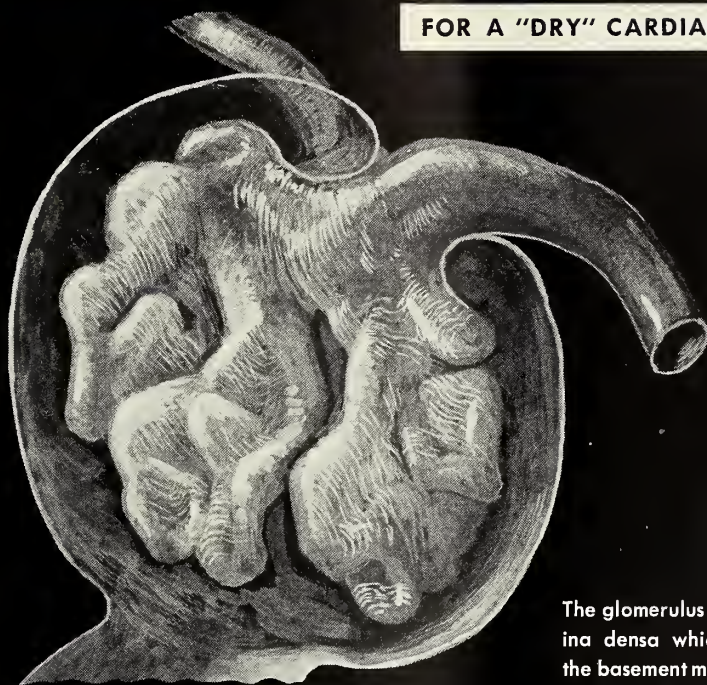


Figure 2. Necrotic pancreatic tissue surrounded with leukocytes. Left, area of normal pancreas. Right, necrotic duct containing bile plug which has activated the proenzymes of the pancreas.

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Research in the Service of Medicine.

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SEARLE

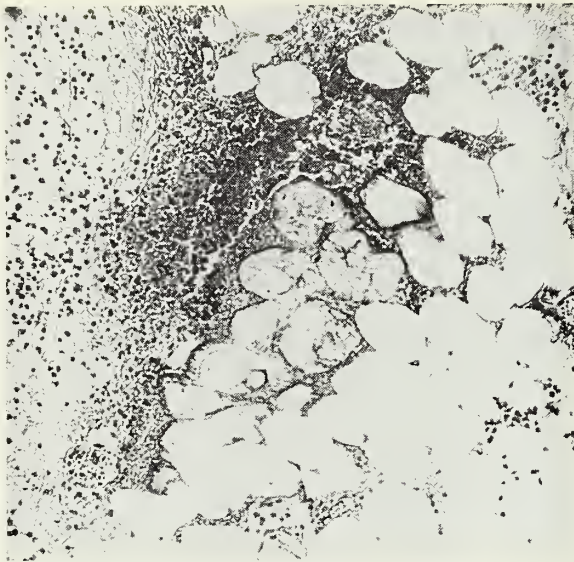


Figure 3. Fat necrosis in omentum.

in the common duct, one stone impacted in ampulla of Vater.

Microscopic sections (Figure 1) showed the typical necrosis of pancreatic and fat tissue. In one section bile was noticed in a minute pancreatic abscess.

Discussion

Fatal acute pancreatitis is infrequent. According to Herbut it occurs in 0.2 per cent of all patients coming to autopsy. It predominates in the sixth decade and afflicts slightly more females than males.

Of the many possibilities which activate the pancreatic enzymes producing acute pancreatitis, the classical mechanism is reflux of bile into the pancreatic duct, either by spasm of the sphincter of Oddi or by biliary calculi. This process is well illustrated in our case (Figure 2). The activated trypsin destroys the pancreatic parenchyma that it contacts, while lipase attacks fat, producing the telltale white spots in the omentum and on the peritoneal surface. The liberated tissue products absorbed into the blood stream produce the generalized toxic reaction.

In a survey of 25 fatal cases of acute pancreatitis, Robert and co-workers state that acute interstitial pancreatitis and acute pancreatic necrosis should be regarded as different stages of one process rather than separate entities. The average age in their series was 51.9 years. Sixty-four of their patients were obese. Serum amylase varied from 800 to 4,000 units; serum lipase was in five of eight patients (60 per cent) greater than normal (1.0 ml. of n/20). In only seven of their cases (28 per cent) was the diagnosis of acute pancreatitis made clinically; in five additional cases (20 per cent) it was suggested correctly.

Eighty-six per cent had from 300 to 3,000 cc. of fluid in the peritoneal cavity; in 72 per cent of the positive cases it had bloody or brown color. Five of the 25 patients (20 per cent) had generalized peritonitis. In 72 per cent, severe necrosis involving almost all of the pancreas was noticed at autopsy, while in 28 per cent one-half or less of the gland was involved. Eighty-four per cent had gross hemorrhage in the pancreas, 64 per cent showed fat necrosis grossly within the gland, and 50 per cent showed abscess formation. All 25 cases showed fat necrosis either in the pancreas or elsewhere.

Of greatest interest are their findings in the biliary tract. By gross inspection, 83 per cent of the gallbladders were found to be chronically inflamed, and 68 per cent had gall stones; only 22 per cent were without stones. A common ampulla was present in 82 per cent, and in 23 cases an impacted stone was found in the ampulla.

Microscopic examination of the pancreas revealed hemorrhage in 92 per cent. In all 25 instances extensive necrosis of the parenchyma and of fat tissue with calcium deposits was noticed. Ninety-four per cent had histologic evidence of chronic inflammation of the gallbladder. These findings justify the standpoint of many surgeons that in recurrent pancreatitis it seems most important to eradicate any existing biliary tract disease, including calculi.

From the etiologic standpoint, most fascinating to me in acute pancreatitis is the fact that we deal with an inflammation due to entirely endogenous agents while bacteria, if present at all, are only secondary invaders. I know of only one other glandular organ where exogenous agents also are not the cause of inflammation but where the inflammation results from hormonal-chemical products; I have in mind the so-called subacute thyroiditis of DeQuervain.

In regard to the difficulties of diagnosing acute pancreatitis, I would like to add one other disease which has to be differentiated. I remember one case about 15 years ago in which autopsy revealed hemorrhagic pancreatitis. The clinical diagnosis by an excellent internist was coronary occlusion.

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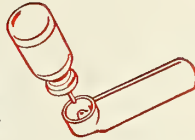


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LOS ANGELES

PHYSICIANS' ACTIVITIES

Dr. J. P. Berger represented the Sedgwick County Medical Society on a Wichita Chamber of Commerce industrial tour to the east.

Dr. J. Gordon Claypool has returned to his practice in Howard after having completed a residency in internal medicine at the University of Pennsylvania and a year's additional work in medicine at the University of Kansas Medical Center.

A feature story about **Dr. Charles Pokorny**, Halstead, was published in the *Newton Kansan* recently. The story concerned Dr. Pokorny's hobby of raising orchids.

Dr. Winstan L. Anderson, Atchison, was recently elected president of the Atchison Chamber of Commerce.

The Arkansas City Chamber of Commerce has named **Dr. William G. Weston** chairman of its Arkalalah Committee. The committee plans a city festival for October of each year.

Dr. Russell A. Nelson, Wichita, was recently named president of the Wichita Exchange Club.

A scientific paper, "Ascites," by **Dr. Mahlon Delp**, of the University of Kansas Medical Center, was published in the December issue of *Arizona Medicine*.

Dr. Marita Scimeca, formerly of Kiowa, is now practicing in Atchison. Her husband, Dr. S. A. Scimeca, a dentist, began practice in Atchison last fall.

A Marysville physician, **Dr. Ralph J. Warren**, who has been associated with **Dr. H. H. Haerle**, has been called into military service. He is to report for duty at San Antonio on February 28.

Dr. Leslie H. Cobb, Mulvane, announces that **Dr. Eugene Winchester**, now a member of the staff

at St. Joseph Hospital, Wichita, will be associated with him in practice after July 1. Dr. Cobb is a graduate of Creighton University School of Medicine.

Dr. Jack T. Peterson, who was recently released from active duty at the Fort Riley Station Hospital, is now practicing in Junction City in association with **Doctors Carr and Smiley**. Dr. Peterson, after his graduation from the University of Kansas School of Medicine, had two and one-half years of practice before serving a surgical residency and entering the service.

An office in Hutchinson has been opened by a husband and wife team of physicians, **Dr. Marion M. Sumner** and **Dr. Joyce Sumner**, both of whom are graduates of the University of Kansas School of Medicine. Dr. Marion Sumner will engage in general practice, and his wife will specialize in anesthesiology.

Dr. Marion A. Throckmorton, Wichita, spoke on "The Kidney, the Key to Evolution," at a recent meeting of the Sedgwick County Medical Assistants' Society.

The treatment of dental patients who have heart conditions was discussed by **Dr. Ernest W. Crow**,

DEATH NOTICES

OSCAR L. ERICKSON, M.D.

Dr. O. L. Erickson, 68, a member of the Shawnee County Medical Society, died at a Topeka hospital on January 4 after an extended illness. A native Topekan, he had practiced there since his graduation from Kansas Medical College in 1912. During World War I he served with the Army Medical Corps in France.

HARVEY ELIJAH VAN NOY, M.D.

Dr. H. E. Van Noy, 76, who had practiced in Lawrence since 1928, died at his home there on January 13. A graduate of Ensworth Medical College in 1907, Dr. Van Noy practiced first in Linwood. He was an honorary member of the Douglas County Medical Society.

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"side effects . . . [are] notable by their absence"¹

1. Carter, C. H., and Maley, M. C.: Antibiotics Annual 1956-1957, New York, Medical Encyclopedia, Inc., 1957, p. 51.

Wichita, at a meeting of the Wichita Dental Society on January 14.

Plans to open an office in Garden City on March 1 have been announced by **Dr. Robert M. Fenton**, who has been practicing in Greensburg since July, 1955.

Dr. Alexander R. Chalian is now practicing anesthesiology in Topeka in association with **Doctors Floyd C. Taggart, W. O. Martin, and Joseph E. Gootee**. He is a veteran of service with the Army and had been practicing in California before coming to Kansas.

Dr. John L. Lattimore, Topeka, spoke on "Functions of the Coroner's Office" at a course on law enforcement at the University of Missouri, Columbia, in January.

Cancer Conference in March

Arrangements are now being completed for the Ninth Annual Mid-West Cancer Conference to be held at Wichita on Thursday and Friday, March 7 and 8. Taking part in the program will be **Dr. Vincent P. Collins**, Houston; **Dr. Wilhelm C. Hueper**, Bethesda; **Dr. John H. Lawrence**, Berkeley; **Dr. Walter T. Murphy**, Buffalo; **Dr. Joseph H. Pratt**, Rochester, Minnesota; **Dr. Lee Stoddard**, Augusta, Georgia; **Dr. Grantley W. Taylor**, Boston, and **Dr. John M. Waugh**, Rochester, Minnesota.

Biographical sketches of six of the speakers were published in the January issue of the JOURNAL. Additional information is now available.

Dr. Stoddard will speak on pathological subjects. He is professor of pathology at the Medical College of Georgia, a diplomate of the American Board of Pathology, and a member of the American Association of Pathologists and Bacteriologists.

Dr. Joseph H. Pratt, a gynecologist, has been head of a surgical section at the Mayo Clinic since 1945. He is also an assistant professor of surgery in the graduate school of the Mayo Foundation, University of Minnesota. He is a fellow of the American College of Surgeons and a member of the Central Association of Obstetricians and Gynecologists.

The following program will be presented:

THURSDAY MORNING

Surgical Aspects of Carcinoma of the Pancreas and Ampulla of Vater—**Dr. Waugh**
Surgical Aspects of Carcinoma of the Breast—**Dr. Taylor**

Proton Irradiation of the Pituitary Gland in Carcinoma of the Breast—**Dr. Lawrence**
Radiation Therapy of Carcinoma of the Breast—**Dr. Collins**

THURSDAY AFTERNOON

Indications and Results of the Pull-Through Operation for Carcinoma of the Rectum—**Dr. Waugh**
Use of Isotopes in Cancer—**Dr. Lawrence**
Malignant Melanomas—**Dr. Taylor**
Growth of Human Tumors—**Dr. Collins**

FRIDAY MORNING

Radiation Therapy of Cancer of the Cervix—**Dr. Murphy**
Newer Developments in Occupational and Environmental Carcinoma—**Dr. Hueper**
Carcinoma of the Human Uterine Cervix—**Dr. Stoddard**
Consumer Goods and Cancer Hazards—**Dr. Hueper**

FRIDAY AFTERNOON

Carcinoma of the Vulva—**Dr. Pratt**
Radiation Aspects of Ovarian Cancer—**Dr. Murphy**
A Pathologist's Views on Treatment of Carcinoma in Situ of the Uterine Cervix—**Dr. Stoddard**
Functional Malignancies of the Ovary—**Dr. Pratt**

A luncheon session each day will feature a question and answer session. A man of note as an inspirational speaker, **Dr. Samuel S. Mayerberg**, rabbi of the congregation B'Nai Jehudah, Kansas City, Missouri, will present the address at the banquet Thursday evening. He is active in many civic and cultural organizations and is serving on the board of directors of the Conservatory of Music in Kansas City, United Jewish Social Services, American Cancer Society, the Starlight Theater Association, and the Kansas City Safety Council. He has also taught courses on Old Testament literature and Hebrew history at the University of Kansas.

It should be remembered that the Social Security contribution is a tax, not an insurance premium. It is not even a "special" tax in any meaningful sense. What goes into the Social Security "trust fund" is a government bond. The money is paid into the general fund of the United States Treasury, and is spent for any purpose the government spenders see fit.

The bond amounts to an I.O.U. from the government, and when it comes time to pay the pensioners Uncle Sam will have to levy new taxes to pay the face amount. If that is not embezzlement, the difference is not very great.—*Omaha World-Herald, August 23, 1955.*

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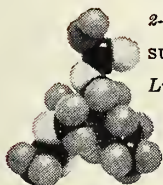
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COUNTY SOCIETIES

The following officers of the Bourbon County Society were elected at a meeting held at Fort Scott recently: president, Dr. Jesse R. Pritchard; vice-president, Dr. John Aldis, and secretary, Dr. James J. Basham.

Dr. Donald B. Effler, of the Cleveland Clinic, Cleveland, was guest speaker at a meeting of the Sedgwick County Society held at Wichita on January 8. His subject was "Esophageal Hiatus-Hernia."

Members of the Saline County Society were hosts to members of the Golden Belt Medical Society at a meeting held at Holiday Inn Motel, Salina, on January 10. Dr. J. Walker Butin, Wichita, spoke on "Post-Gastrectomy Dumping Syndrome," and Dr. David M. Gibson, Kansas City, Missouri, presented a clinicopathological conference.

Dr. Francis J. Nash was named president of the Wyandotte County Society at a meeting held at Kansas City in December. Dr. Matthew R. Fitzpatrick was elected vice-president, Dr. William F. Roth, Jr., secretary, and Dr. Wray Enders, treasurer.

At the January meeting of the group Dr. E. W. J. Pearce presented a paper, "Complication of Transverse Lie in Obstetrics."

Members of the Miami County Society, at a meeting held in December, chose Dr. William O. Appenfeller, Osawatomie, to serve as their president for 1957. Dr. Rex C. Stanley, Paola, was named vice-president, and Dr. Melvin Masterson, Louisburg, was elected secretary-treasurer.

Dr. Lloyd W. Reynolds, Hays, spoke on developments in the Blue Shield program at a meeting of the Central Kansas Medical Society in Hays recently. Dr. William J. Spanos, of the University of Kansas Medical Center, discussed "Toxemias of Pregnancy with New Therapy and Management Trends." At the business session the following officers were elected: president, Dr. Frank A. Dlabal, Wilson; vice-president, Dr. Rex C. Belisle, Hays; secretary-treasurer, Dr. Wendale E. McAllaster, Russell.

Members of the Shawnee County Society voted two assessments for 1957 at a meeting held at Topeka

on January 7. The sum of \$5.00 will be contributed by each for sponsorship of a science fair, and \$15 from each active member will be donated to the American Medical Education Foundation, with half that amount contributed by members in other categories. The society again voted approval of a plan for tuberculin testing of all school children in the county, a project scheduled for completion in a three to five-year period.

The scientific program consisted of four case reports on different conditions: endometriosis, presented by Dr. Robert E. Pfuete and discussed by Dr. Frank Smith; malignant hypertension and hemorrhagic pancreatitis, presented by Dr. Nathaniel Uhr and discussed by Mr. William S. Simpson; malocclusion, presented by Dr. Earl E. Welch (D.D.S.) and discussed by Dr. Roberto Moulun; thorazine dermatosis, presented by Dr. Hubert L. Harris and discussed by Dr. Robert K. Jones.

Dr. Frank K. Bosse took office as president of the Atchison County Society at a meeting held in Atchison early in January. Dr. Ira R. Morrison is the new vice-president, Dr. Charles H. Young is secretary, and Dr. Wayne O. Wallace is a delegate to the state meeting. Serving as alternate is Dr. Arthur Whitaker, and on the board of censors are Dr. Winston L. Anderson, Dr. Bosse, and Dr. Morrison.

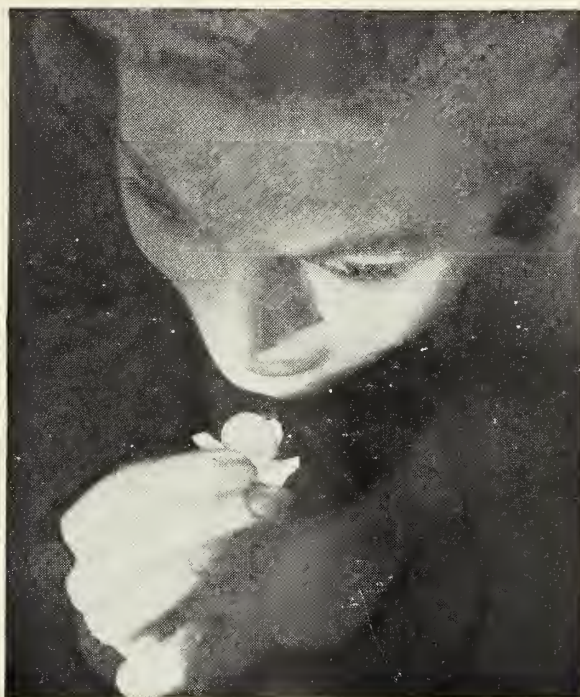
Obstetrical Society Meeting

A meeting of the Kansas State Obstetrical Society will be held at the Country Club in Junction City on Thursday, March 14, beginning at three o'clock. The program will include two presentations by Dr. Robert B. Wilson of the Mayo Clinic: (1) a sound movie on cesarean section with a discussion of technique and (2) observations on endocrine problems in obstetrics and gynecology. A refreshment hour and dinner will follow the program.

The Kansas State Obstetrical Society will also hold a meeting at the time of the annual session of the Kansas Medical Society in Wichita in May. Details of that session will be announced later.

More than 6,000 foreign physicians are in the United States this year to complete their professional training as interns or residents. Approximately 1,700 Americans are studying at foreign medical schools.

In 1955, 37,800 Americans were killed in traffic accidents.



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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

The broad issue of federal construction grants for medical schools pending before the 85th Congress raises again a major question: To what extent is there a physician shortage in the United States?

The administration, through Secretary Folsom, maintains that the need for more doctors and research scientists is increasing rapidly as the population rises, as medical science grows more complex, and as research programs are greatly expanded. And, he adds, the need undoubtedly will continue to increase in the years ahead.

Many of these schools already are in a critical financial plight, Mr. Folsom argues, and they need increased private and public funds "just to meet regular operating expenses." Under these circumstances, without further aid, "many schools face almost impossible obstacles in raising funds for construction of new classrooms, laboratories, and other facilities." He then sounds this warning:

"Unless effective action is taken now toward providing these facilities, the shortage of medical scientists will grow much more acute in the years ahead, and the health of the American people will be retarded."

To solve this problem, the administration wants to broaden the program enacted last year for \$30 million a year for three years to help build and equip laboratories doing research in various diseases. It asked the last Congress for \$50 million a year for five years for both research laboratories and teaching facilities. The legislators granted only the \$30-million-a-year part. That, says the administration, is not enough.

And to bolster that contention, Mr. Folsom cites the record on the laboratory facilities act: within three months after authorization, requests totalling well over \$100 million were received by the Public Health Service.

But when the committees of Congress—in all likelihood starting with the House Interstate and Foreign Commerce group—launch their hearings, members will want to know just how short the country is of doctors and whether reports of shortages take into account the increased productivity of each physician in the light of new techniques and other medical advances.

On the opening day of the 85th Congress, health legislation emerges as a popular subject. Of the approximately 2,000 bills, resolutions, and private measures introduced that day, 70 were marked for study by the Washington Office of the American Medical Association. Experience has shown that about 3 per cent of all measures are of medical importance.

Many of the bills were duplicates of those in the last Congress, while others were revised versions of old favorites. In the latter category were the Jenkins-Keogh bills (again bearing the numbers H. R. 9 and H. R. 10) which would provide tax deferment on money paid in annuity plans, and the Bricker Amendment for keeping international treaties from affecting internal laws of the U. S.

The tax deferment proposal was changed in several respects, the most important being a provision for withdrawal of money from plans in advance of age 65, upon payment of a tax penalty. The key section in the proposed constitutional amendment sponsored by the Ohio Senator states that "A provision of a treaty or other international agreement not made in pursuance of this Constitution shall have no force or effect."

One of the few surprises in the opening day rush to the bill hoppers was a bill by Rep. Poage (D., Tex.) to authorize the secretary of HEW to make long-term, 3 per cent-interest loans to non-profit hospitals for construction and expansion of facilities, including nurses homes. Certain sectarian groups have been pressing for just such a plan in lieu of taking federal grant money under the Hill-Burton program.

Moving to fill two major spots in the Department of HEW, President Eisenhower has named as assistant secretary 36-year-old Elliott L. Richardson, a Boston lawyer and son of the late Dr. Edward P. Richardson of Massachusetts General Hospital and Harvard Medical School. Mr. Richardson served at one time as law clerk to Judge Learned Hand and Justice Felix Frankfurter, as assistant to Senator Saltonstall, and as consultant to former Governor Christian Herter, now Under-Secretary of State.

To succeed Dr. Lowell T. Coggeshall as special assistant for health and medical affairs, the President appointed Dr. Aims C. McGuinness, a Philadelphia pediatrician who was last in Washington as a clinical consultant to the United Mine Workers Welfare and Retirement Fund. He was responsible for the medical staffing of the fund's 10 memorial hospitals in three mining states. Dr. McGuinness was dean of the University of Pennsylvania Graduate School of Medicine and one-time director of Children's Hospital of Philadelphia.

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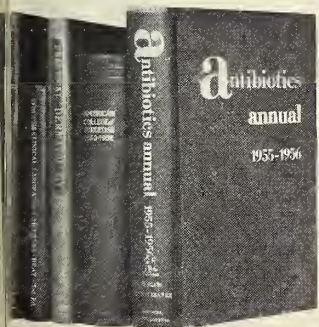
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1. Romansky, M.J., et al., Antibiotics Annual 1955-1956, p. 48,
2. Waddington, W. S., Maple, F. C., and Kirby, W. M. M., A.M.A. Archives of Internal Medicine, 1954, p. 556.

Mucoviscidosis

A Study of Its Clinical Features and a Review of 51 Cases

CHARLES F. ORTHWEIN, M.D., *Kansas City*

Since its original description by Andersen¹ in 1938, mucoviscidosis (fibrocystic disease of the pancreas) has become an important entity in pediatrics. The name "mucoviscidosis" was introduced by Farber² in 1945, since it was found that pancreatic insufficiency is only one feature and that the disease actually involves many systems. Because of certain clinical manifestations of the disease, this term is considered objectionable by some authorities.^{3,4} Mucoviscidosis will be the term used in this paper, however, because a better term is as yet unknown to the author.

Regardless of terminology, the disease is a systemic one of childhood with a variety of clinical appearances, which depend on the time the lesions manifest themselves and on the organs affected. I will attempt in this paper to discuss the clinical features of the disease as seen in 51 cases at the University of Kansas Medical Center and will not touch on its etiology, pathology, diagnosis, or treatment.

Mucoviscidosis is no longer considered a rarity to be discussed only by the pediatric pathologist; wide interest is now being shown by all pediatric clinicians. No exact data are available from which to estimate the true incidence of the disease in the general population. Andersen⁵ found the incidence to be 3 per cent of autopsies in infants and children at Babies Hospital in New York City. She estimated from this figure an incidence of 1.7 per 1,000 live births.

Accumulated experiences from the literature indicate that the disease occurs equally in both sexes, in all economic and social classes, in many racial groups, over wide geographic areas in a variety of climates, and in individuals enjoying diverse nutritional habits. In our clinic, as will be discussed later, we have been impressed with the higher incidence in the white than in the Negro population. Holt and McIntosh⁶ reported that in affected families approximately one-fourth of the siblings will exhibit the disease. The evidence suggests a Mendelian recessive trait, with variations in expression perhaps

due to environmental factors. Increased awareness of this disease, growing interest in it, and advances made in newer diagnostic procedures have been the chief factors responsible for the striking increase in recognizable cases during recent years.

Clinical Features

Andersen¹ in 1938 proposed a clinical classification of the disease in which she divided the patients into the following groups:

Group I: Meconium ileus

Group II: Cases with early onset of respiratory infection

(A) Small group: continuous or intermittent diarrhea in neonatal period

(B) Most patients: failure to gain on adequate diet; large, foul, formed stools and chronic respiratory infection

Group III. Cases with late onset, especially presenting as celiac disease.

The simplicity of this classification is apparent, and because of its simplicity its usefulness in understanding the variety of clinical appearances that this disease may present is limited. The clinical separation of distinct groups that these patients may fall into is difficult because of the wide range of clinical manifestations and the varying course of the disease. The extreme variations in the picture depend upon the age of onset, organ or organs involved, degree or severity of involvement, rate of progression of the lesion, and the modification brought about by treatment. The majority of patients appear with the commonest manifestations: weight loss, abnormal stools, and chronic respiratory infection, but because so many patients may present varying clinical features it seems worthwhile to review the various manifestations of the disease.

Case Studies

With the summary of clinical features in mind, an intensive study was undertaken of the records of 51 proved cases of mucoviscidosis observed at the University of Kansas Medical Center. Many of these patients were referred to this hospital for confirmation of the clinical impression of mucovisci-

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Orthwein is now serving his internship at the University of Kansas Medical Center.

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LOS ANGELES

TABLE 1
SUMMARY OF CLINICAL FEATURES.*

1. Family incidence
2. Meconium ileus
3. Nutritional
 - a) Failure to regain birth weight in usual time
 - b) Abnormal stools: foul, large, frequent, poorly formed
 - c) Malnutrition
 - d) Abdominal distention
 - e) Retarded physical growth and development
 - f) Rectal prolapse
 - g) Jaundice
 - h) Vitamin deficiency
 - i) Vomiting episodes
 - j) Abdominal pain
4. Pulmonary
 - a) Early onset, often before 6 months
 - b) Persistent cough, at first mild, at times paroxysmal
 - c) Wheezing respirations, suggesting asthma
 - d) Recurrent infections, bronchopneumonia
 - e) Increased A-P diameter of chest
 - f) Reduced exercise tolerance
 - g) Clubbing
 - h) Cyanosis
 - i) Hoarse voice
 - k) Low grade or no fever, leukocytosis frequent
 - l) Early physical examination of chest may be negative, though x-ray may show emphysema and atelectasis
 - m) Bronchiectasis
 - n) Right-sided cardiac hypertrophy
 - o) Respiratory acidosis
5. Diminished drooling in infancy
6. Excessive sweating
7. Immediate response to therapy often dramatic
8. Bleeding episodes
9. Cirrhosis
10. Intestinal obstruction
11. Delayed onset of menses

* Modified from Shwachman, H.; Leubner, H., and Catzel, P.: Mucoviscidosis. In: Levine, S., *Advances in Pediatrics*, Year Book Publishers, 7, 1955, pp. 261.

dosis. Some were diagnosed as having mucoviscidosis prior to their observation here. Many were diagnosed during a short observation, and follow-up studies are not available. Quite a number were diagnosed and observed, and their courses were noted until the time of their demise. In the majority of such patients autopsy records are available.

All of these 51 proved cases of mucoviscidosis presented variations in the disease picture, and it was because of these varying features that the study was undertaken. Any clinical finding of the disease in any given patient at any time during that pa-

tient's observation was noted. The range of clinical manifestations is emphasized by a list of some of the hospital admission diagnoses of patients later shown to have mucoviscidosis.

TABLE 2
ADMISSION DIAGNOSES OF PROVED CASES OF MUCOVISCIDOSIS.

| <i>Congenital</i> | <i>Pulmonary</i> |
|---------------------------------------|---|
| Congenital heart disease | Bronchiectasis |
| Congenital cystic disease of the lung | Asthma |
| <i>Miscellaneous</i> | Bronchopneumonia, acute |
| Neurotic traits | Bronchopneumonia, chronic |
| Cirrhosis of liver | Upper respiratory infection |
| Ascites | Chronic respiratory infection |
| Jaundice, idiopathic | Bronchitis, acute |
| Dehydration | Bronchitis, chronic |
| Pansinusitis | Atelectasis |
| Sinusitis | Undiagnosed disease of respiratory system |
| Acute tonsillitis | Pharyngitis |
| Mental retardation | Bronchiolitis, acute |
| Non-thrombocytopenic purpura | Emphysema |
| Bacteremia (staphylococcus) | <i>Nutritional</i> |
| Maternal anxiety | Celiac disease, idiopathic |
| Microcytic hypochromic anemia | Malnutrition |
| Otitis media | Prolapse of rectum |
| Shock | Pancreatic infantilism |
| Hypocholeemia | Celiac syndrome |
| Streptococcal sore throat | Idiopathic steatorrhea |
| Convulsive disorder, etiology unknown | Milk allergy |
| Low salt syndrome | Diarrhea, idiopathic |

Discussion

It was remarked earlier in this paper that mucoviscidosis is considered a hereditary disease, governed apparently by a recessive Mendelian trait with some variations in expression which are poorly understood. Holt and McIntosh⁶ report that in affected families about 22 per cent of the siblings exhibit the disease. Kagan⁴ reports that the usual expectancy is one of four from a family. McDonald⁷ and others seem to be in agreement with this incidence. In our series of cases, 18 per cent of the patients gave a history of some other member of their family being similarly affected.

In this series there appears to be no seasonal distribution; cases occurred regularly throughout the year. Cases were distributed fairly equally between the two sexes with a few more female cases (30 of 51) than male (21 of 51).

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Mucoviscidosis is said to be more prevalent among the white than among the colored population. Zuelzer and Newton⁸ reported three colored patients in their series of 36 cases from an institution where approximately 50 per cent of the patients are colored. There is only one colored patient among the cases studied in this series from the University of Kansas Medical Center, and approximately 50 per cent of the pediatric patients are colored. This would support the idea of higher incidence among the white.

It is well recognized by most authorities^{1, 3, 4, 9, 10} that the commonest manifestations of the disease occur in infancy as a result of lung and pancreatic lesions. The onset of these lesions and the symptoms produced by these lesions differ from patient to patient, as seen in this series. If the pancreatic lesion occurs during the latter part of intrauterine life, the result is an inspissated meconium which may cause intestinal obstruction shortly after birth. Meconium ileus is the term used to refer to this type of intestinal obstruction, which usually occurs in the terminal ileum of the newborn.

Thomsen and Vesterdal¹¹ pointed out in their paper that a connection between meconium ileus and pancreatic fibrosis was stated as early as 1905 by Landsteiner. In 1938 Andersen¹ reported that meconium ileus is merely an early manifestation of pancreatic fibrosis. The clinical picture of a newborn with meconium ileus consists of a history of vomiting, failure to pass meconium, and distention of the abdomen. The diagnosis may be aided by the palpation of a mass in the right lower quadrant and the presence of a characteristic roentgenological picture.

According to Holt and McIntosh⁶ it may be assumed that the patient with meconium ileus will develop fibrocystic disease, since all reported survivors so far have done so. The incidence of meconium ileus in relation to other forms of mucoviscidosis varies from author to author. Zuelzer and Newton⁸ reported five cases of meconium ileus among 36 cases in their series. Shwachman, Leubner, and Catzel¹⁰ found one case of meconium ileus in every nine cases of mucoviscidosis. In our series there were only two cases of meconium ileus, which seems to be a low incidence compared with those of other authors. Meconium ileus is generally considered as the most severe form of mucoviscidosis because of the high mortality associated with it.

Considerable attention has been given to the age incidence of this disease. Little time will be spent here on this aspect of the disease because of the lack of sufficient follow-up data on the majority of these patients. In general, however, the largest number of patients in most series are under five

years, with a rare patient surviving to age ten years or more. In a report by Kagan⁴ the average death age was 13 months between 1940 and 1948, and the average death was at 45 months between 1949 and 1953. Shwachman, Leubner and Catzel¹⁰ reported a well authenticated case of a patient who lived until the age of 22½ years. One patient in this series was known to have lived until the age of 13½ years.

The pancreas is often affected at birth, but the loss of exocrine secreting ability by this organ may be gradual in onset. Those patients with a gradual onset of pancreatic insufficiency develop nutritional symptoms insidiously. The child is often considered normal at birth but fails to gain weight during the early weeks of life. There can be three to five stools a day which are considered normal. The first foul odor to the stools is often noticed with the addition of solid foods to the diet. Appetite in these patients may be excellent or even voracious. The stools may take on enough abnormality in the form of excessive size, foulness of odor, poor formation, or frequency to cause some concern by the parents. If the concern becomes great enough, then the parents may bring it to the attention of the pediatrician.

With this symptomatology to focus upon and an adequate history, the pediatrician should consider mucoviscidosis in his effort to find the cause of these abnormal stools. With such insidious development of the manifestations of the disease, the proper diagnosis may be delayed. Tests for mucoviscidosis have centered primarily upon the evaluation of pancreatic function. These studies are usually of value because the pancreas is affected in most cases, even in early infancy. The problem obviously becomes more difficult in cases where the pancreas functions adequately at birth and for a number of months, or even years, thereafter.

When the pancreatic insufficiency becomes pronounced enough, or if intestinal involvement occurs, a steatorrhea ensues. When the pancreatic manifestations become intense, digestive processes are handicapped, and retarded physical growth and malnutrition occur. These may be so pronounced that muscular wasting may be observed, particularly in the buttocks. These manifestations of pancreatic or alimentary involvement have been thoroughly described by such authorities as Andersen,¹ Farber,² Shwachman,¹² and others. Abdominal distention, commonly present in this disease, was seen in quite a large share of the patients reviewed in this series (43 of 50).

Shwachman¹² states that rectal prolapse will be observed in 5 per cent of these patients at one time

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or another. McIntosh,¹³ in his review of 23 patients who had reached the age of ten years or more, reported that approximately 25 per cent of patients showed a history of rectal prolapse at some time in the past. In our series of cases, a history of rectal prolapse was found in 9 of 51. Occasionally a patient with undiagnosed mucoviscidosis will present himself with a chief complaint of rectal prolapse as evidence of malnutrition.

The age of onset of pancreatic, alimentary, or nutritional symptoms may vary greatly from patient to patient. Some patients with mucoviscidosis will have no nutritional manifestations of their disease, but they have other manifestations such as pulmonary involvement as their chief problem. Three of our 51 cases gave no history of pancreatic or nutritional symptomatology. Many of these patients had the onset of nutritional symptoms on the first day of life. One of these patients did not show such symptoms until the age of two years. The great majority (39 of 51) did show nutritional manifestations in their first six months of life.

Jaundice has been described as an occasional part of the clinical picture of mucoviscidosis. Gatzimos and Jowitt¹⁴ reported four cases of this disease with persistent jaundice as a predominant clinical sign. This is ordinarily an unusual sign of the disease. One case in this series did show rather persistent jaundice as a manifestation of her disease.

It has long been known¹ that there is often a defective absorption of fat-soluble vitamins in these patients. Shwachman¹² states that they show better absorption of the alcohol or aldehyde form of vitamin A than the acetate form. Osteoporosis has been described by many authors^{4,7,12,15} as a manifestation of this disease, and this is probably because of a deficiency of calcium salts.

Vomiting without apparent cause has been described¹⁶ as a fairly common symptom of this disease. This may be a prevalent symptom in summer months when children are likely to have episodes of low salt syndromes due to excessive loss of electrolytes in sweat.^{3,17,18}

McIntosh,¹³ in his review of 23 cases where patients had reached the age of ten years or over, reported that approximately 25 per cent of these patients show a history of abdominal pains with no relationship to eating at some time during their life. At times the complaint of abdominal pain may be severe enough to require hospitalization. One author¹⁰ wonders whether "spasm," the eating of difficult-to-digest food with impaction, intermittent intussusception, or volvulus may cause these acute episodes. Failure of the pancreas to secrete an alkaline fluid renders the duodenal environment more acid, a condition which may be responsible for some

of the vague abdominal complaints occasionally encountered.

Many of the pulmonary manifestations of this disease were described by Andersen¹ in her original article in 1938. The onset of these symptoms varies, as do the nutritional symptoms, from patient to patient. The onset is usually early, but this does not necessarily follow in all cases. The lungs are very rarely affected at birth. The degree and progression of the pulmonary process determine, to a large extent, the course and prognosis of the illness.

Three of the 51 cases in this series showed pulmonary manifestations without the coexistence of nutritional symptoms. The majority of the patients showed nutritional symptomatology prior to respiratory symptomatology, but nine of the 51 cases showed the reverse. Four showed simultaneous appearance of both respiratory and alimentary tract symptoms. The earliest date of onset of respiratory symptoms was at age seven days; the latest date of onset was at age four years. Shwachman, Leubner, and Catzel¹⁰ reported that 80 to 90 per cent have pulmonary symptoms during the first year of life. Thirty-six in this series had the onset of pulmonary symptoms prior to age six months, and an additional six patients had the onset between the ages of six to twelve months.

The usual history is that the patient develops a cold between the ages of one and six months, after which a hacking cough persists. It may be paroxysmal, simulating pertussis, and accompanied by vomiting. Little is characteristic at this stage, although moderate leukocytosis and slight anemia may be present. A roentgenograph of the chest may show increased bronchovascular markings, but usually little more. Sooner or later, however, chronic respiratory symptoms appear. In advanced cases there are invariably recurrent bouts of bronchopneumonia, reduced exercise tolerance, bronchiectasis, digital clubbing, and even respiratory acidosis and cardiac complications of pulmonary hypertension. West and Di Sant'Agnes,¹⁹ in their study of pulmonary functions in patients with mucoviscidosis, found that the residual volume was increased and the ventilatory capacity impaired. Bronchial obstruction, due to intraluminal factors not to be discussed in this paper, plays the chief role in the respiratory involvement of the patient with mucoviscidosis.

McIntosh,¹³ in his review of 23 cases where the patients had reached the age of ten years or over, reported that all 23 cases developed some degree of pulmonary osteoarthropathy. Eight of the 51 cases in this series showed such changes at some time during their observation.

Chronic involvement of the paranasal sinuses is supposed to be sufficiently common to constitute a classical feature of mucoviscidosis.¹³ There was only

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one patient in this series who presented himself with such a manifestation.

Roentgenological findings on the chest x-rays of these patients have been described as being characteristic late in the disease.¹¹ The x-ray picture varies from increased bronchovascular markings to extensive peribronchial infiltration and pneumonia. Indeed, the roentgenologist may suggest the diagnosis to the clinician from a chest x-ray prior to the clinician's serious consideration of the disease. Chest x-rays were interpreted as being consistent with the clinical diagnosis of mucoviscidosis in 44 of the 51 cases in this series.

Shwachman, Leubner, and Catzel¹⁰ have remarked on the lack of drooling or "reduced" drooling in the same age group, referable to a defect in the secretion of the salivary glands. Di Sant'Agnese, Darling, Perera, and Shea¹⁸ reported that the parotid secretory rate is abnormally high in patients with mucoviscidosis and that the sodium and chloride concentrations in mixed saliva are likewise elevated. Such changes in salivary secretions were not noted in the records of the patients in this series.

Excessive sweating has long been considered as a manifestation of mucoviscidosis.¹² History of such symptomatology was found in 16 of the cases in this series. Kagan⁴ reported that during warm weather these patients secrete sweat with excess salt content. He reported one patient in whom this excessive sweating so depleted the blood volume that renal failure resulted. Di Sant'Agnese, Darling, Perera and Shea^{3,17,18} have found a considerable increase in sodium, chloride, and potassium secretion in the sweat of these individuals. They state further that the defect is in the sweat glands themselves and that the defect shows itself in the form of increased electrolyte secretion and not in the production of sweat. This relationship has recently been used to great advantage in the form of a diagnostic test for mucoviscidosis in patients in whom the lung is the main organ involved and in whom pancreatic function tests may prove unfruitful.³ Because of the elevation in secretion of electrolytes in the sweat of these patients, they are particularly prone to episodes of low salt syndromes in the hot summer months.

Bleeding episodes have been described⁴ as an occasional manifestation of mucoviscidosis. This is usually bleeding from the nose or rectum and occurs because of low vitamin K. The low vitamin K may be due to malabsorption of such from the gastrointestinal tract because of the steatorrhea or the continuous use of antibiotic therapy and the inhibition of bacterial formation of vitamin K.

Another occasional manifestation of this disease is cirrhosis of the liver. Webster and Williams²⁰

reported on five patients who developed an unusual type of hepatic cirrhosis. Steinbach, Crane, and Bruyn²² state that the liver frequently undergoes fatty metamorphosis. Cirrhosis of the liver with portal hypertension and hypersplenism has been reported.⁷ McIntosh,¹³ in his review of 23 cases where the patients had reached the age of ten years or over, reported that 20 per cent developed some degree of liver involvement. It is considered by the majority of authorities as a late manifestation of the disease.

Most patients with mucoviscidosis suffer from mal-digestion of long duration, and therefore it does not seem strange that they should show some evidence of fatty metamorphosis of the liver. The protein dietary deficiency in these patients is considered to lead to an accumulation of fat in the liver as a result of the failure on the part of the cells of the hepatic parenchyma to discharge the function of phospholipid synthesis normally vested in them—a function to which certain amino acids of protein derivation are essential (choline and methionine).²⁴

Twenty-four of the 51 patients in this series showed evidence of hepatomegaly on physical examination. Autopsy on one case in the series revealed, among other changes, a far-advanced Laennec's cirrhosis of the liver, esophageal varices, and hypersplenism. Autopsy on three cases showed advanced fatty metamorphosis of the liver.

Intestinal obstruction has been described as a late complication of mucoviscidosis by Fisher¹⁶ in a patient of 15 months of age. This rare complication may be due to (a) abnormal secretion produced by gastric and intestinal glands, (b) absence of pancreatic enzymes as a result of disease, or (c) insufficient therapeutic dose of pancreatin.

McIntosh,¹³ in his review of 23 cases where the patients had reached the age of ten years or over, stated that there seemed to be a tendency towards delayed onset of menses. Since the vast majority of these patients die far prior to the age for the onset of normal menses, this manifestation should be no more than mentioned.

Summary

This paper discusses the clinical features of mucoviscidosis from a review of 51 cases seen at the University of Kansas Medical Center. It is thought that the best hope for the future of these patients lies in the early recognition and diagnosis of the disease with the prompt institution of an effective prophylaxis to impede its further progression.

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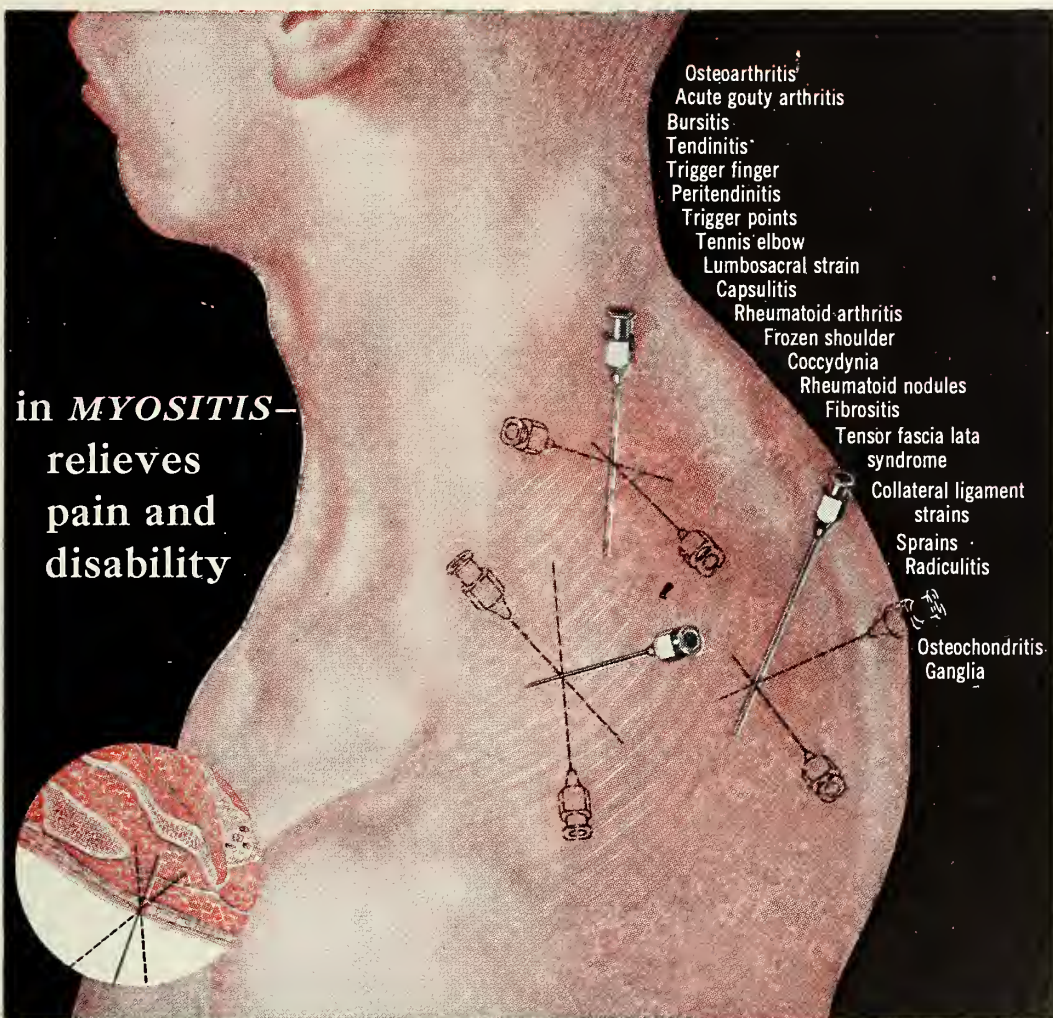
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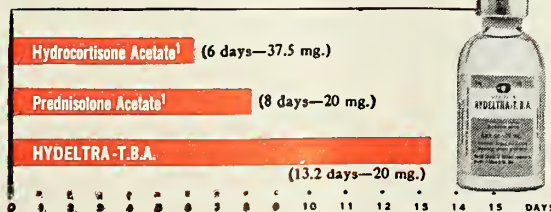
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Rheumatic Fever Research Started

A clinical laboratory and research project on rheumatic fever and kindred diseases has been started at Providence Hospital, Kansas City, through a project jointly sponsored by the hospital and the University of Kansas School of Medicine. Dr. Tom R. Hamilton, chairman of the Department of Medical Microbiology at the University of Kansas Medical Center, will direct the program. He will also continue his work at the university and carry on his present research program supported by the American Heart Association and area heart associations.

Assistants and consultants to Dr. Hamilton in the new program will be Dr. Alvar Werder in virology, Dr. Perry Morgan in immunochemistry, Dr. Thorkil Jensen in parasitology and mycology, and Dr. Lyle Von Riesen in bacteriology and antibiotics.

Hospital funds for the program are derived from the Ford Foundation grant of 1955 and other gifts.

ANNOUNCEMENTS

Course in rheumatic diseases, University of Texas Postgraduate School of Medicine, Houston, February 27-March 1. Tuition \$40. Write Texas Medical Center, Houston 25, Texas.

March 1 deadline for submitting applications to National Foundation for Infantile Paralysis for post-doctoral fellowships. Next deadline September 1. Write Division of Professional Education, 120 Broadway, New York 5, New York.

Regional meeting, American College of Gastroenterology, Grand Rapids, Michigan, March 17. Programs available from College, 33 West 60th Street, New York 23, New York.

Medicolegal symposium sponsored by American Medical Association, Denver, March 22 and 23. Registration \$5.00. Send registrations to Law Department, A.M.A., 535 North Dearborn, Chicago 10, Illinois.

Second Inter-American Medical Convention, Hotel El Panama, Panama City, April 3-5, under sponsorship of Medical Society of the Isthmian Canal Zone.

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Fifth annual interim meeting of District VII, American College of Obstetricians and Gynecologists, Statler-Hilton Hotel, Dallas, April 12-13.

Ninth annual convention, International Academy of Proctology, The Plaza, New York, April 29-May 2. No fee. Write the Academy, 147 Sanford Avenue, Flushing, New York.

Approval of two-year residency program in general practice at U. S. Army Hospital, Fort Knox, Kentucky, given by A.M.A. Council on Medical Education. First year devoted to medicine and medical sub-specialties, including pediatrics; second year devoted to surgery and surgical sub-specialties, including gynecology and obstetrics. Write Department of the Army, Office of Surgeon General, Technical Liaison Office, Washington 25, D. C.

BOOK REVIEWS

Practical Pediatric Dermatology. By Morris Leider, M.D. Published by C. V. Mosby Company, St. Louis. 433 pages. Price \$10.50.

This excellent book has much to recommend it. There are sound basic principles for diagnosis and therapy. Dr. Leider has listed 101 useful dermatologic preparations for topical applications with specific amounts of each ingredient and notes on the actions and use of each prescription. Numerous charts and tables are used throughout the book. These are most complete and especially valuable in sorting out symptoms, locations, dermatoses, and their various treatments.

Treatment, whenever discussed, is spelled out in detail. The exact amount of a medication is recommended, and the author tells how it is applied, how often, and for how long. Dermatologic terms are defined in some detail. This is most appreciated by the uninitiated.

The first three chapters deal with the basic science

aspect and general principles of diagnosis and therapy of the dermatoses. Etiology is the basis for grouping the dermatoses in the next seven chapters. The chapter on dermatoses due to allergy is particularly good. The concept of allergy and its numerous skin manifestations is clear and concise. The lack of importance attached to diet and emotional disturbances would, I suppose, be argued by some.

Dr. Leider has charm and wit in his writing. He also has force and authority. Reading this book is a valuable experience and an entertaining one. I envy his students.—O.L.M.

Heart Sounds, Cardiac Pulsations, and Coronary Disease. By William Dock, M.D. Published by University of Kansas Press, Lawrence. 97 pages. Price \$2.50.

This volume is a stimulating, albeit concentrated, bit of reading. It presents an excellent discussion of the heart sounds, including a report of Dock's own work with "a gadget for eliciting heart sounds under water." This portion of the book alone justifies its publication, and all physicians would do well to read it.

The third part of the book is a discussion of coronary disease and the inevitable cholesterol. The author is convincing in his logical presentation of pertinent literature, and his conclusions therefrom seem justified. The section on cardiac pulsations is rather difficult to read because the diagrams and figures are not often adjacent to the relevant text. However, the complex subject is well summarized. The references are adequate.

The work is well done with only one typographical error, and that of little consequence. The reviewer would prefer to have larger type for the explanatory notes under each figure. The index is excellent.—G.L.N.

Care of the Long-Term Patient. Chronic Illness in the United States. Volume II. Commission on Chronic Illness. Published for the Commonwealth Fund by Harvard University Press, Cambridge. 589 pages. Price \$8.50.

This book is one of a series of four volumes on the problem of chronic illness in the United States. The series covers the phases of prevention and care of chronic illness in rural areas, and in large cities. It represents an attempt to sum up the best available knowledge on this subject and to indicate solutions to what is admittedly a major social and economic problem.

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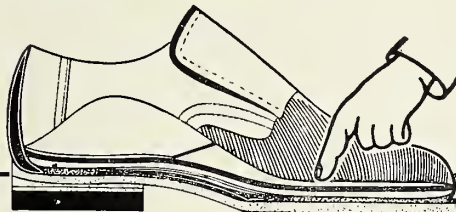
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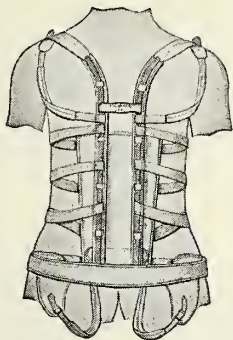
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A.M.A., and has received assistance or representation from practically every group concerned in any way. The work has gone on since 1949, culminating in a conference of 600 interested persons in 1954. The basis of the text is a list of 80 conclusions and recommendations adopted by the commission after this conference. The text serves to amplify, explain, and substantiate these with as much data and material as practicable.

This book is devoted to the problem of care for chronically ill patients in this country. Its scope is set forth in the first section, which attempts to define the problem, present its dimensions and their magnitude, and describe the present status of care. Specific attention is then given to various aspects of the problem, particularly where such patients can be best cared for, who should care for them, and how they can best be rehabilitated. Next, consideration is given to how this may be accomplished, with sections on the coordination and integration of activities concerned, research in the field, and the financing of care. Finally, there is appended a considerable amount of specific data and relative detailed information.

None of the material in this book is original information, though a great deal of new study was done in preparation for it. Rather, it is a summary of information gained from many sources and an attempt to draw useful conclusions. Some of these conclusions are of particular interest to physicians.

Great emphasis is placed on the importance of the personal physician in the care of the long-term patient in all phases of his illness. It was strongly urged that greater efforts be made to care for these patients in their homes, and that community facilities be organized to aid the physician in this task. As a logical sequence to this attitude, physicians are urged to make better and greater use of ancillary facilities available, and it is recommended that physicians learn to take a longer range of view of chronic illness, with emphasis on rehabilitation and the team approach to medical care.

A specific recommendation is made that physicians in practice keep records which will permit study of the development and progress in chronic illness, as they observe it in their patients, to increase our understanding of this problem. Finally, individual physicians may be interested in the commission's indecision on the question of extending Social Security benefits to disabled persons, which led to a watered-down recommendation and a strong minority report.

This is not a medical textbook, nor is it intended primarily for physicians, but it deals comprehensively with a subject which is of interest in one way or another to every physician. It will be interesting to any physician who wishes to gain a better perspective of his own role and that of his patient in this community problem. Portions of it will be valuable to the physician who serves on institutional or organizational boards or other policy-making bodies. It will be a valuable reference for the physician who is called upon to advise on, or discuss, some aspect of the many-sided problem of chronic illness. The material is authoritative and represents the thinking of acknowledged leaders in the various fields concerned. It is well organized and clearly written. The printing and publishing are quite satisfactory.—J.E.S.

Official A.M.A. Book of Health. Edited by W. W. Bauer, M.D. Published by Dell Publishing Company, New York City. 320 pages. Price 35 cents.

This paper-back book, to be found on any Dell rack at the corner store, has been compiled from articles and editorials originally published in *Today's Health*. It contains, therefore, information that is authentic, appropriate, and well written. In the introduction Dr. Bauer says, "It does not give you cures for diseases, nor lists of symptom by which you can deceive yourself into thinking you have an illness which you do not have. It *does* give you sufficient information about the human body to be useful in

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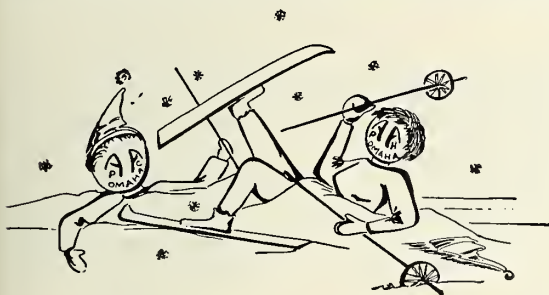
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what you want most to do, namely, to live in good health with success and happiness."

Patients who ask for information on matters pertaining to health will find much of interest in this volume.—P.F.

Diseases of the Heart and Circulation. Second Edition. By Paul Wood, M.D. Published by J. B. Lippincott Company, Philadelphia. 1005 pages. Price \$15.

This is a superb textbook. Dr. Wood has covered the field of cardiovascular disease from the viewpoint of a single authority surprisingly adequately.

The chapter on physical signs illustrates well the outstanding ability of the author in this field. His comments on the clinical importance of the venous pulse of the phonocardiogram of interventricular pressure curves and of carotid pulse are especially well written.

The chapter on congenital heart disease is probably the best chapter in the book. This one chapter is 147 pages in length, and is a textbook within itself. This chapter is especially valuable because it summarizes the experiences of the author's own group in the general field of congenital heart disease.

There are three outstanding textbooks of cardiology—White, Friedberg, and Wood. It would be impossible to choose one of these three books inasmuch as each reflects the special brilliance of its own author.—E.G.D.

Research in Allergy Expanded

An expanded program of research in allergy and infectious diseases was started recently, according to a report from the U. S. Department of Health, Education, and Welfare. The National Microbiological Institute, which is being redesignated as the National Institute of Allergy and Infectious Diseases, will administer the program.

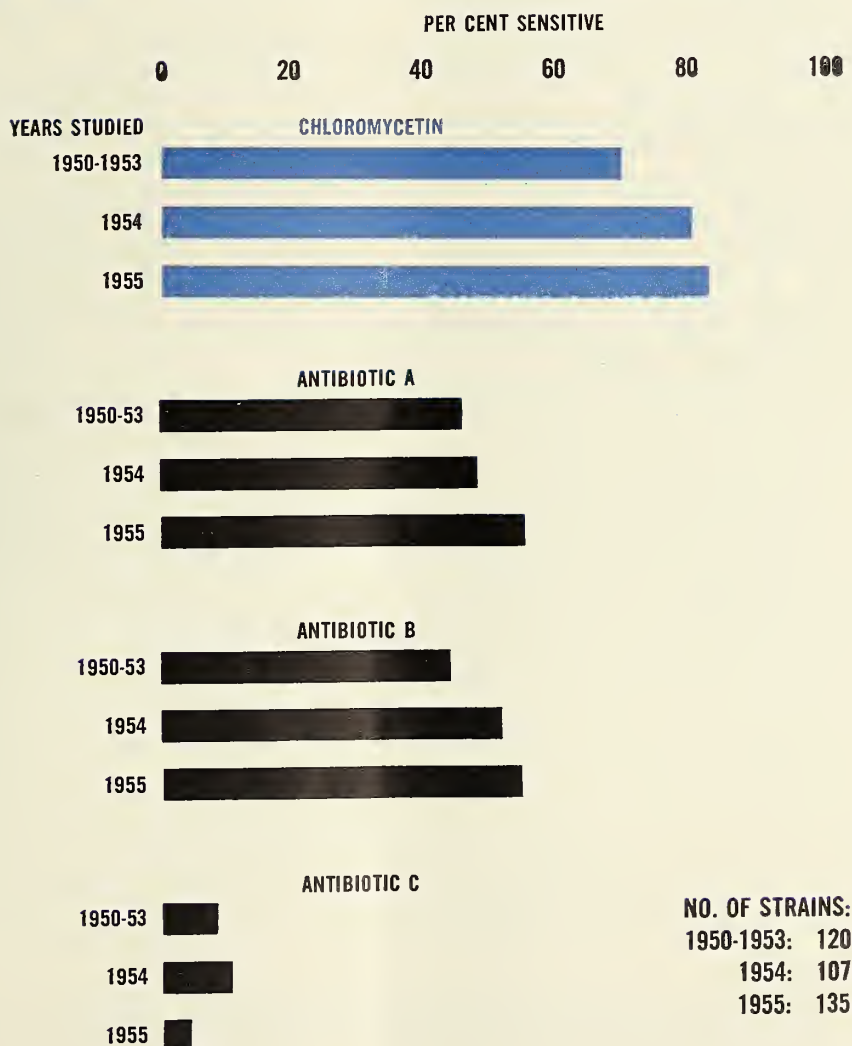
It is estimated that 16 million persons in this country suffer from some form of allergy. Some manifestation of allergy is experienced by at least 50 per cent of all people at some time in their lives.

The institute will support long-term basic studies through grants to research scientists in universities and medical schools. An increase of more than \$3,000,000 is being sought for the program for the fiscal year 1957.

Traffic safety has become one of the most urgent challenges to the American public. Last year's toll: 38,300 killed; 1,350,000 injured, and an economic loss of nearly five billion dollars. This is the worst record in 14 years.

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PERCENTAGE OF NONRESISTANT STRAINS OF STAPHYLOCOCCUS AUREUS SENSITIVE TO CHLOROMYCETIN AND THREE OTHER MAJOR ANTIBIOTIC AGENTS*



*This graph is adapted from a five-year study by Rantz and Rantz.²¹

THE JOURNAL *of the* KANSAS MEDICAL SOCIETY

Volume LVIII

MARCH, 1957

Number 3

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Volume LVIII

MARCH, 1957

No. 3

The Medical Center Issue

An Introduction by the Dean

This is the fifth time that the opportunity has been presented to me to introduce the Medical Center issue of the JOURNAL. Retrospectively, it is pleasing to note that of the four basic needs of the Medical Center mentioned just four years ago, two have been met and one is now in the planning stage. Later in this issue you will read of our new library and its program, one of the two needs that have been met.

I have no desire to write at length in this issue, and I suspect that you would have no desire to read any lengthy comments that I might make. Our school's progress continues at a rapid pace and all of you, I know, are aware of it.

What I would like to say above all, and I do it now, is that I know of no medical school in this country that has the fine relationship with its state medical society that we do. I believe the Kansas Medical Society and the University of Kansas School of Medicine can take pardonable pride in this relationship; we might well point to it as an example that others can profitably follow. The knowledge that the school has the warm, generous, and complete cooperation of the Society makes my position an enviable one and my task an infinitely lighter one than it otherwise might be. For this cooperation I extend to all of you my own personal as well as my official thanks.

Until the annual meeting, where I hope to see all of you—my kindest regards.

W. CLARKE WESCOE, M.D.

Postgraduate Medical Education

Physical Facilities for Graduate Study at University of Kansas School of Medicine

Construction will begin this month on a one-story brick building adjoining Battenfeld Auditorium at the Continuation Center-Student Union Building on the University of Kansas Medical Center campus. This will provide permanent quarters for the administrative staff of the Department of Postgraduate Medical Education. It is expected that the building can be occupied in the fall of 1957. (See cut, Page 143.)

Physician enrollment in postgraduate education, both in-state and out-of-state, has shown a marked increase during the past three years, so additional office space for administration of the program is coming at a propitious time.

The new area will include a foyer, a combination secretarial office and registration counter, an office for the department chairman, as well as offices for

the executive director and field representatives. Also included will be a conference room accommodating about 60, filling the frequent need for a moderate-size classroom for courses with limited enrollment or small group discussions. A mailing and supply room and a utility area for storing heavy auditorium equipment complete the space to be occupied.

The administrative staff of the department now numbers seven. Besides the chairman of the department and the executive director, there are three secretaries and two field representatives, and part-time clerical assistance. In the past it has not been possible to place the staff in one central location for the most effective coordination of activities. The new building will be a handsome addition to the campus group and a functionally useful one.

Postgraduate Medical Education

The Past, Present, and Future of the University of Kansas Program

**MAHLON DELP, M.D., JESSE D. RISING, M.D., and
WILLIAM D. NELLIGAN, B.S., *Kansas City***

History

With the exception of the years 1922 and 1926, the University of Kansas has offered some type of postgraduate instruction in medicine almost continuously for the past 45 years. Such instruction began in June of 1911 with a cooperative venture between the School of Medicine and the Kansas State Board of Health in arranging and presenting, on the Lawrence campus, the first annual five-day summer school for health officers and physicians. After the first three years, these courses were transferred to the School of Medicine at Kansas City and were expanded to two full weeks annually.

In 1927 the University Extension Division and the School of Medicine offered their first courses on the circuit plan, using six centers in the state of Kansas for the original trial. In 1928 five "short courses" were added to the activities and became permanent features.

Presented by Dr. Delp, chairman of the Department of Postgraduate Medical Education, before the Congress on Medical Education and Licensure, Chicago, February 11, 1957.

In 1942 the president of the Kansas Medical Society requested the cooperation of the University of Kansas and the Kansas State Board of Health in providing intensive circuit-type courses for physicians of the state. Representatives of the three organizations were assembled as a joint advisory committee for the first planning session early in 1943. This union of energies has been continued to the present time.

The creation of the Department of Postgraduate Medical Education of the School of Medicine, in 1945, served to stimulate expansion of all postgraduate activities. This step represented the attainment of a degree of maturity in the administrative structure, permitting organized planning, unified administration, and development of policy based upon sound principles in medical education. Although chief responsibility for the entire program rests immediately upon the university and the medical school, the state medical society still retains co-sponsorship through its Committee on Postgraduate Medical Study.

The whole program of postgraduate medical education in Kansas is an integral part of the Kansas Plan for Rural Medical Care, formulated in 1948.

This is the historical background for one program of postgraduate medical education, which may be considered a prototype of programs involving a medical school and a state medical society. The barest fundamentals involved in any educational project include a student, a teacher, and a curriculum; therefore, postgraduate medical education may be and is carried on in a successful manner using other methods. Several of such plans are being presented today.

Organization

The topmost administrative body of the University of Kansas is its Board of Regents, to whom the chancellor is directly responsible. He and the deans of the various schools formulate policy in an administrative pattern common to most state universities. The dean, with the aid of his faculty, guides activities and controls policy within the medical school. Postgraduate medical education is designated as a distinct function falling upon a separate department within the medical school. As such, it has its own responsibilities, prerogatives, and the usual amount of autonomy. Department administration is carried on by a chairman and an executive director.

The Kansas Medical Society has an administrative structure similar to other such state organizations. Its committee for postgraduate activities is the Committee on Postgraduate Study. A joint advisory committee is composed of the group just mentioned, the chairman of the Committee on Medical Schools, the chairman and one member of the Committee on Rural Health, one official from the Kansas State Board of Health, one official from the Kansas Academy of General Practice, and additional selected individuals who join with the chairman of the Department of Postgraduate Medical Education and the dean of the medical school as an actual working and policy-mak-

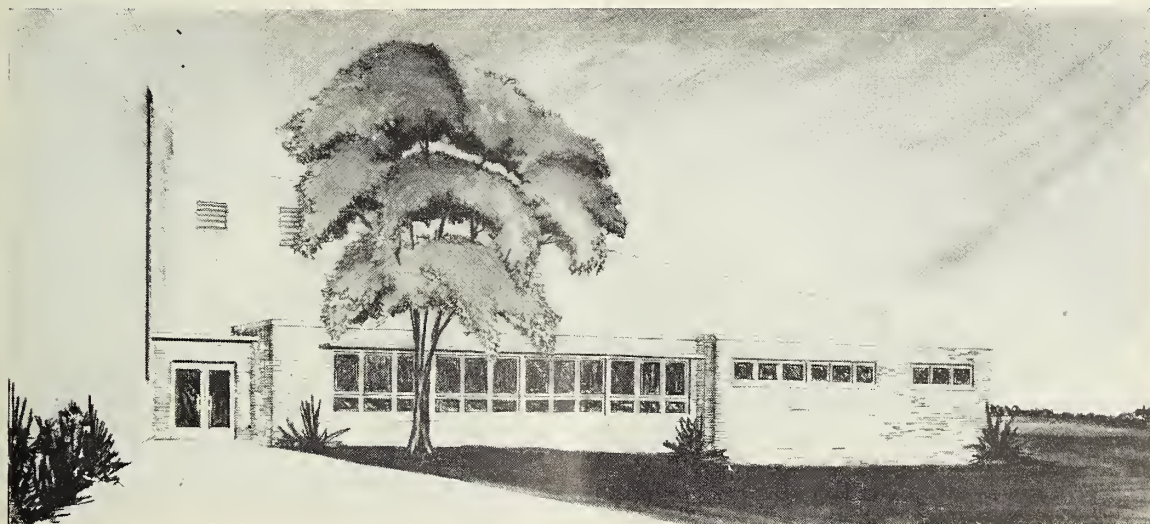
ing group. The term "working" is used advisedly, because this group annually spends from eight to ten hours in session discussing the past year's activities and problems facing the department, and actually building in outline the content and format of programs for the ensuing year.

It might seem that the organizational structure is too bulky and loosely-bound for good administration, but experience has proved this not so. The program administration, in the last analysis, falls directly and properly upon the medical school. The medical school also supplies the other essentials; i.e., (1) curriculum, (2) faculty, (3) facilities, (4) budget, (5) educational methods, and (6) evaluation of the enterprise.

Objectives and Purposes

The objectives of this program, as outlined in our last annual report, are—as might be expected—similar in general terms to all other such programs. Medicine has become so complex that it is obviously not possible to present a completely detailed and sustaining knowledge concerning every medical and related discipline in a four-year period. Consequently, four years of undergraduate medicine, internship, and even residency supply merely the foundation for a lifelong study of medicine. Continuation study, aimed at acquiring new knowledge and skills, renewing former ones, and preserving and increasing professional competence, constitutes postgraduate medical education. Providing environment and atmosphere for accomplishing this is the objective of the Kansas program.

Formerly designed for and directed at the generalists in our region, the program is now geared to the needs of every physician, regardless of his interest or field of specialization. Preservation of competence,



Architect's drawing of building to be completed next fall.

TABLE 1

COURSES IN POSTGRADUATE MEDICINE OF-
FERED BY THE UNIVERSITY OF KANSAS
SCHOOL OF MEDICINE, 1956-57

| FOR MEDICAL PROFESSION | |
|--|--|
| <i>Symposia (Short Courses)</i> | |
| Obstetrics | |
| Internal Medicine | |
| Pulmonary Disease Clinic | |
| Gastroenterology | |
| Surgery | |
| Radiology and Radioactive Isotopes | |
| The Heart: Cardiac Arrhythmias | |
| Neurology | |
| Symposium on Pain | |
| Pediatrics | |
| Electrocardiography | |
| Hematology | |
| Ophthalmology and Otolaryngology | |
| Anesthesiology | |
| Cardiac Auscultation | |
| Symposium on Leptospirosis | |
| <i>Intermittent Courses</i> | |
| General Practice | |
| Surgery-Operative Clinics | |
| Kansas Circuit Course | |
| <i>Correspondence Courses</i> | |
| Interpretation of Electrocardiograms— Courses I and II | |
| <i>Special Skills Courses</i> | |
| Radiological Physics | |
| Histochemistry | |
| Clinical Use of Radioactive Isotopes | |
| <i>For Allied Professions</i> | |
| Operating Room Nurses Institute | |
| School Health Conference | |
| Medical Technology | |
| Nursing and Nursing Education | |
| Hearing and Speech Conference | |
| Anesthesiology for the Dental Profession | |
| Institute for Vocational Rehabilitation of Mentally Ill | |

renewal of former skills, and acquisition of new knowledge is a need of all physicians, not of one group alone.

The prime responsibility of the Kansas program is the physician of Kansas but, feeling a regional responsibility and encouraged by a regional response, the department no longer regards the state boundaries as valid limitations to its activities.

No longer are all programs prepared exclusively for physicians. We now recognize the need for providing continuation education for ancillary medical personnel such as nurses, technicians, physical therapists, etc. More recently, we have assumed the re-

| TOTAL ENROLLMENT - - 3760 | |
|---|------|
| Physician Enrollment | |
| Symposia | 1417 |
| Intermittent Courses | 546 |
| Correspondence Courses | 299 |
| Advanced, Clinical and Investigative Technics | 53 |
| Clinical Traineeship | 4 |
| Total Physician Enrollment | 2319 |
| Figure 1—Physician Enrollment for 1955-56 | |

sponsibility for a fourth phase of medical education—namely, that of health education for the lay public.

The real aim of all medical education should be to improve the health of our people. Increasing the skills of all those engaged in medical care and increasing the understanding regarding health matters for those receiving the medical care are, therefore, prime objectives. This final statement indicates clearly our potential student body.

Scope and Structure of Present Program

An immediate view of this program can be gained from the course offerings and enrollment for the period of July 1, 1955, through June 30, 1956.

Local Attitudes Toward Postgraduate Education

During the past 10 years the Kansas program of postgraduate education has matured and has become effective and extensive as an enterprise in continuation education. This situation, however, came about after almost 40 years of effort. The most recent step in the program's development, and the one which gave it the greatest stability, was the creation of the Department of Postgraduate Medical Education within the medical school. This provided the needed

| Allied and Ancillary Personnel Enrollment | |
|---|------|
| Doctors of Philosophy | 6 |
| Doctors of Dentistry | 52 |
| Medical Technicians | 199 |
| Registered Nurses | 692 |
| Lay Persons | 492 |
| Total Ancillary Enrollment | 1441 |

Figure 2—Non-Physician Enrollment for 1955-56

administrative structure. Of equal importance and coming earlier in the development of this program was the joining of efforts with the potential student body of the state medical society. These two features in origin would not have been sufficient without the whole-hearted acceptance by the dean of the medical school and the university administration of postgraduate education as a part of the responsibility of a medical school. This acceptance was outlined clearly by the administration in 1948 as a part of the Kansas plan for rural medical care.

Voicing publicly this responsibility of the medical school met with the spontaneous approval of the Kansas Medical Society, in such a manner as to impress every faculty member. It was an important step in renewing a desirable relationship with the practicing physicians within the state.

There has evolved in Kansas a working relationship between the state medical society and the medical school of the state university which has made possible an increasingly mature and extensive program of medical education. At no time in this relationship between the Society and the medical school has there been a conflict or friction which in any way impaired the prerogatives or fundamental policy of the school. The Kansas Medical Society through its Committee on Postgraduate Study has functioned as a helpful advisory committee and has at no time attempted to dictate policy. Such a pleasant relationship is in part the result of the medical school's approval of the over-all program, and of the real acceptance by the Society of this program as "their program," primarily designed for them with their help, and for which they have a paternalistic attitude.

The faculty of the School of Medicine has, by years of close association with the postgraduate program, become more sympathetic toward the additional burden of this phase of teaching. When the faculty was smaller resistance did exist, but it was lessened by the whole-hearted acceptance by the dean and the university administration of postgraduate education as a part of the school's responsibility.

PHYSICIAN ENROLLMENT FOR 1955-56

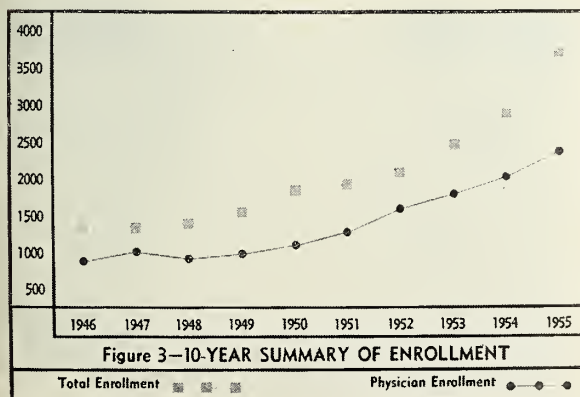
| | |
|---------------------------|-------------|
| Kansas | 1096 |
| Other States | 1211 |
| United States Territories | 2 |
| Foreign Countries | 10 |
| TOTAL | 2319 |

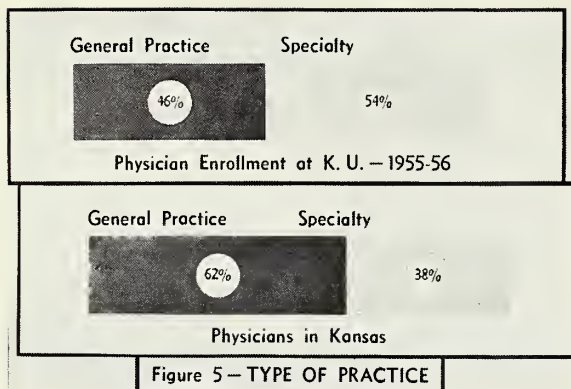
Figure 4 — ENROLLMENT GEOGRAPHY

Structuring a new Department of Postgraduate Medical Education with a departmental chairman, an executive director, and adequate personnel to do much of the routine work added a new dignity to the local program and administrative sanction to its permanence. All of this served to diminish the objections of the overworked undergraduate teacher who had not originally thought that such activities would be included in his duties. This was particularly true of the basic science instructors. Coloring the reluctance of this group was their inherent fear of disapproval when appearing before clinicians. Gradual fortification of the faculty with additional members, and inclusion in their initial interviews of a stipulation of responsibility to postgraduate education has overcome this problem. At present there is not a single member of any department of the medical school who does not willingly and frequently help with this form of teaching. One basic science teacher has, on several occasions, stated that he has never previously had such an excellent opportunity to assay the results of his undergraduate teaching.

The constant participation of basic science along with clinical teachers in teaching teams, both on the "circuit" and in "short courses," has done much to eliminate the schism between basic scientists and practicing physicians. It has vastly improved the morale of the basic science teachers by fostering a closer relationship with men who use their basic discoveries in daily practice. This team association has also done much to improve the level of teaching by the clinician, who all too often is quite off-hand in interpreting disturbed physiology and other basic phenomena, if there is no one about to check his enthusiasm.

The liberal use of "guest faculty" members for participation in all "short courses" lessens the burden on our own faculty, but the local faculty assumes full responsibility for the "circuit" programs as well as for the "clinical traineeships." For the "short courses" they assist with ward rounds, conferences, and panel





discussions, participating only occasionally in didactic presentations.

Distinguished guest faculty members have always been used in this program as a means of supplementing our own staff and of increasing program appeal and effectiveness. There is no question about the soundness and popularity of the practice, both among our faculty and the enrollees.

Self-Analysis and Evaluation

It will be said today that the ultimate aim of postgraduate education is the fostering of the best quality of medical care by each practicing physician. Therefore, it behooves an alert administrator in this field to appraise or inquire into the character and type of practice in the region served. He should learn of the needs and desires of his potential student body concerning program content, format, instructional staff, favorable dates for courses, and appropriate fees.

One can immediately appreciate the need for perpetual self-analysis and evaluation as elements in the continuation of successful operation of a program of postgraduate medical education. No medical administrator should be satisfied with organizing such a venture and then sitting back complacently to let it operate year after year without continuing study, appraisal, evaluation, and improvement.

This department has sought such information from its student body in several ways:

1. Questionnaires sent out by the medical society to individual practicing physicians inquiring about their own types of practice as well as about many of the common questions confronting a producer of postgraduate courses.

2. Registration data secured on each enrollee and tabulated annually, including: (a) city and state of practice, (b) field of practice, (c) medical school, (d) year of graduation, (e) distance traveled. This tabulation is subjected to continuous analysis.

3. An individual study of the patient material seen and treated by a group of representative general

practitioners holding appointments as medical school preceptors is currently being carried out with the assistance of our medical student preceptees.

4. Each program produced is subjected to critical study by submitting to each enrollee a questionnaire concerning the specific program, its content, format, teaching techniques, fees, and suggested improvements.

Collection of registration data and "postmortem" information on programs is routine and continuous. The survey of medical practice in our state as well as the data regarding the individual practitioner, his training, his field of practice, etc. are special projects to be repeated at suitable intervals. Securing such information is essential to the success of a postgraduate program.

Physicians cannot be compelled to attend continuation study exercises, an impelling conscience being the only effective incentive. Only the American Academy of General Practice has had the courage to suggest more effective compulsion. The postgraduate student must be attracted to a program, and his interest must be captivated to hold him. His body cannot be captured as can the undergraduate's. The program must be sound, useful, and inspirational if he is to remain. It must promise the same for the future if he is to return. Programs must be planned carefully, promoted effectively, and produced well if they are to serve their purpose. This requires constant study and restudy of one's own problems. To date, there is no large and reliable clearinghouse of information or fostering influence to guide the school, department, or other producer of postgraduate medical education. Each must chart its own course.

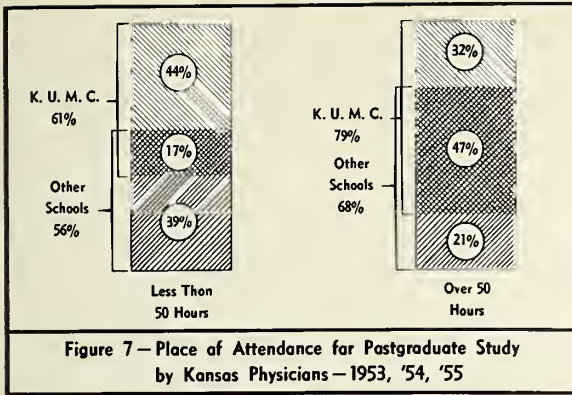
Such useful data as shown in the following charts was gathered during the past year by the survey methods mentioned above.

Future

Looking to the future, we envision retention of the present administrative structure as a department in a

| Distance Traveled | Total Physician Enrollment |
|--------------------|----------------------------|
| Less than 25 miles | 328 |
| 25-100 miles | 186 |
| 100-200 miles | 256 |
| 200-300 miles | 360 |
| 300-500 miles | 157 |
| 500-1000 miles | 96 |
| Over 1000 miles | 60 |

Figure 6 — DISTANCE TRAVELED TO ATTEND POSTGRADUATE COURSES AT K. U. M. C.—1955-56



medical school, using the same teaching staff, and retaining close identity with the parent medical school. Establishing a separate division or school would sacrifice something built deliberately—a teaching staff committed to all phases of medical education. The close liaison with the state medical society has been a major factor in the growth and security of our program, and retention of this relationship is essential.

Equally necessary is continued long-term planning of the programs of "intermittent" and "short" courses to fit the needs of the physicians of this region, with careful attention to curriculum material, effective methods of presentation, and selection of a competent faculty.

One of America's real contributions to medical education has been in the field of graduate medical education. Residency training is a proved method of giving, at least temporarily, a high degree of professional medical competence. The usual "short" and "intermittent" courses cannot be compared with it for effectiveness. This observation leads to a desire to increase our "clinical traineeship" teaching, simply because of the superiority of this method.

Acceptance of a fourth phase of medical education as a reality, and engaging in and assisting voluntary health organizations in health education we consider to be another important future objective.

We must continue the collection of data from registrants, the study of problems and practice of our student body. This sort of research and critical analysis is, at present, the only means available for evaluation and improvement of the program. Ultimate determination of whether a program is raising the level of medical care and inspiring the hoped-for response in the student body defies a direct approach. Further research in methods and modalities of teaching should represent another field of study for a progressive program. Increased use of television, the development of new "home study" courses, and exploratory courses in yet untried fields represent further possibilities in development.

Summary

The Kansas program of postgraduate medical education has, during the past 14 years, found new vitality and purpose. Most important in this change has been the association with the state medical society—the program's student body. Next in importance has been recognition by the university and the medical school of a prime responsibility for this phase of medical education. The school's acceptance took tangible form in the creation of a Department of Postgraduate Medical Education and giving it: (1) administration, (2) faculty, (3) facilities, and (4) budget. The department provided the remaining essentials: (5) curriculum, (6) teaching methods, and (7) self-analysis and evaluation.

The future will be secure if sound educational policies based upon continuing critical self-appraisal are maintained. Acceptance of the program is assured so long as the mutually profitable relationship with the student body is existent.

No man was ever endowed with a judgment so correct and judicious in regulating his life but that circumstances, time and experience would teach him something new, and apprise him that of those things with which he thought himself the best acquainted he knew nothing; and that those ideas which in theory appeared the most advantageous, were found, when brought into practice, to be altogether inapplicable.

—Terence

The Medical Center Library

Physical Properties and Service Potentials

G. S. T. CAVANAGH, *Kansas City*

Few groups are more keenly aware of the importance of the printed word than workers in scientific medicine. A good library, properly staffed and housed, is essential to any institution engaged, as is the Medical Center, in medical education, research, and patient care. And access to books is necessary to any physician who wishes to continue his education on a personal as well as on a formal level. With the kind of support the Medical Center Library is now receiving, it becomes possible to offer library service outside the institution itself.

Libraries thrive on use and, also, on cooperation. Their ideal, obviously, is to make it possible for any medical worker to obtain any piece of medical literature, wherever and whenever published. To attempt to build complete collections all over the United States is neither feasible nor necessary. Instead, an unofficial system of service has grown up with the newly reorganized National Library of Medicine, Washington, D. C., at the head. Any physician may purchase microfilm or photostat copies directly from that institution, and any local library may borrow books and journals from it. But before this is done it is expected that local resources will be exhausted.

In practice this means that the Kansas medical man who has no direct access to a library should first apply to the Stormont Medical Library, State House, To-

Extension Service

Of the 28,000 books and periodicals loaned by the Medical Center Library last year, about three per cent went by mail to physicians, hospitals, and medical societies outside the university. In addition several thousand pages of photostats were supplied and a limited amount of bibliographical searching was carried on for the medical community of Kansas at large.

Requests for loans, photostats, or reference service should be addressed to the Reference Librarian, University of Kansas Medical Center, Kansas City 12, Kansas.

In requesting books and periodicals or photostatic copies, borrowers should send as complete bibliographical references as possible.

In requesting reference service, the problem should be stated fully and exactly, including the period to be searched; e.g. "no material more than ten years old."

An occasional publication, *Library Notes*, which includes a list of new books received, will be sent regularly to any physician or library on request.



The new Medical Center library building is expected to be in use by summer, 1957. Reading rooms, current books and journals, and the historical collection will occupy the two upper floors. Below ground will be space for an additional 90,000 volumes in open stacks.

peka, for the more common English-language medical literature. Failing this, he should apply to the Medical Center Library and, finally, to the National Library of Medicine. With a collection of 50,000 volumes and more than 900 periodicals currently received, the K.U. Medical Library is in a position to satisfy most requests.

Nevertheless, there is a great advantage to the local medical community in organizing and maintaining a current library of its own, however small. By pooling

their resources a few men can gain access to 10 or 12 of the basic periodicals. For \$25 a year the *Quarterly Cumulative Index Medicus*, or for \$13.50 the *Current List of Medical Literature*, makes it possible for subscribers to select further material to borrow from the medical libraries. Hospitals, offices of county medical societies, or local public libraries can serve as clearing-houses for such loans. However, the Medical Center Library is willing to send material directly to any member of the Kansas Medical Society.

Obstetric Complications

Review of Brow, Chin, and Compound Presentations

**LEROY A. CALKINS, M.D., and
EUGENE W. J. PEARCE, M.D., Kansas City**

Brow, face (or chin), and compound presentation are all rather rare. Brow presentation has occurred about twice in each 1,000 patients in our series (including those patients referred to us because of the abnormal presentation). Chin presentation has been slightly less frequent, and the various forms of compound presentation, altogether, occurred in fewer than one in 2,000 patients.

Brow Presentation

Hellman, Epperson, and Connally¹ reported 44 instances of brow presentation in 65,930 deliveries, for an incidence of 1:1498. Posner and Buch² reported 13 "persistent brows" in 46,058 patients for an incidence of 1:3543. Our own material reveals 40 examples in 18,677 patients, or 1:468. This seemingly higher incidence can be accounted for only by a fairly early diagnosis in our series. We had no "persistent brows" such as were reported by Posner and Buck.

Both Hellman et al. and Posner felt that this presentation is more common in multigravida. Our own material shows equal frequency. Contracted pelvis (particularly the inlet) was frequently present in each of the above series. Minor flattening of the inlet was noted in only four of our patients. Gross developmental anomalies, as reported in the above articles and in some textbooks, have always been considered as one of the causes of this presentation. We had two instances of hydrocephalus. A large baby (over 4,000 grams) was present in one of 13 primigravida and in five of 27 multigravida in our series (relative disproportion?). Thus, while largeness of baby may be a factor in producing this presentation,

it is not nearly so striking as in bregma presentation.

Hellman lists prematurity as a cause of extended presentation. Our material includes five infants (two barely so) under 2,500 grams, which is not more (perhaps less?) than the expected number. Dr. Frank P. Light, in discussing Hellman's paper said, "To us, brow is simply a transition phase." Obvious-

In addition to statistical information reported from the literature, this study includes information on incidence of abnormal presentations, description of the course of labor, and a summary of results in patients seen in the Department of Obstetrics, University of Kansas Medical Center.

ly, the etiology, except for a few factors, is not yet clear.

Course of Labor. In our series there were several instances of a long first stage of labor and a few instances of a prolonged first stage—all associated with weak and infrequent contractions. There was also a surprisingly large number of very short first stages—associated with frequent contractions of good intensity. That the abnormal presentation was provocative of weak and infrequent contractions in the former group would seem to be contraverted by the situation in the latter, larger group. As of now, it would seem that the first stage of labor is not markedly altered by brow presentation.

The second stage shows a picture unique to this presentation—

| Type of Delivery | Primigravid | | | Multigravid | | |
|---|-------------|--------|----|-------------|--------|----|
| | No. | Deaths | % | No. | Deaths | % |
| Spontaneous Conversion and Delivery | 7 | 0 | 0 | 16 | 1* | 6 |
| Manual Conversion and Spontaneous Delivery | 0 | 0 | 0 | 4 | 1†† | 25 |
| Low Forceps | 3 | 1** | 33 | 1 | HF 0 | 0 |
| Combined podalic version | 0 | 0 | 0 | 2 | 0 | 0 |
| Cesarean Section (all done for other indications) | 3 | 1† | 33 | 3 | 0 | 0 |

* Hyaline Membrane.

** Eclampsia.

† Hydrocephalus—craniotomy after death.

†† Unknown.

It is quite striking, in this material, that there was not a single instance of failure of spontaneous conversion (to occiput in the majority) when given the opportunity. There was one instance of prolonged second stage (116 minutes) among the primigravid patients. (The remainder averaged 29 minutes.) In the multigravid patients there were four possibly prolonged second stages (not clearly documented), and the remaining 15 patients averaged 13 minutes.

The third stage was also normal. The duration in the first labors averaged six minutes, and the blood loss 170 cc. The multigravid patients averaged five minutes and 128 cc.

Results. One mother died of eclampsia. One other suffered a ruptured uterus, following a combined podalic version, and required hysterectomy and had a stormy recovery. There were seven instances of slight morbidity, one example of pyelitis, and one instance of puerperal endometritis (the craniotomy patient).

The fetal results (immediate) were uniformly good, except for the one infant (see unknown in above table) where manual conversion was followed by spontaneous delivery, and the baby died in a few minutes. Autopsy permission was obtained but, because of a misunderstanding, the examination was not performed.

Conclusions

1. Brow presentation is still not well understood.
2. It should be regarded as a "transitional" situation, in that the first stage will progress in the same fashion as an occiput presentation. In the second

stage it will change to an occiput or face presentation and proceed accordingly.

3. Manual conversion cannot be said to be definitely indicated and can be said to be permissible only if readily accomplished.

4. Cesarean section should be performed only if otherwise indicated.

5. Combined podalic version should be discarded unless otherwise indicated.

Face Presentation

Face presentation, once it occurs either before or during labor, can be expected to persist; and, once diagnosed, it presents a definite entity. Its incidence, as usually recorded, is much more common than brow presentation but less common than transverse. Hellman reported an incidence of 1:468, Posner 1:529, Reddoch 1:550, and Rudolph 1:576. Light, in discussing Hellman's paper, mentioned incidence of 1:749 for colored and 1:606 for white patients. Our own material shows 1:602, which does not include those patients in whom the initial presentation was brow and spontaneous or manual conversion later resulted in a face presentation. The overall incidence would, therefore, seem to be slightly less than two per 1,000.

Etiology. A far forward axis of the uterus, disproportion due to contracted pelvis, or large baby, prematurity, and—most importantly—monsters of the anencephalic type are etiological factors stressed prominently in the literature. Nine of our 31 (not including two second twins) patients had fetuses weighing less than 2,500 grams. Two were anencephalic. Only two (multigravid) patients had babies in excess of 4,000 grams. At present we are not convinced of the role of the various named factors, except the obvious anencephaly. In our series 11 were primigravid and 20 were multigravid, (ten para three or more).

Course of Labor. We had two instances of prolonged labor, but the majority of the labors were remarkably short. The average of the first labors was 15 hours, and of the multiparas (excluding the two prolonged labors) was 7½ hours.

All patients were delivered spontaneously, except our cesarean sections done before complete dilation. The average duration of the second stage in first labors was 36 minutes, and in the multigravida it was 16 minutes. Of the ten primigravid patients proceeding to the second stage, five were anterior and five posterior positions. All rotated and delivered without assistance, except one delivered (by election) by combined podalic version after 27 minutes. Of the 16 multigravida, 13 were anterior. Ten of these delivered without assistance. Manual assistance (by election) to complete the rotation was used in two.

One patient was delivered by combined podalic version because of premature separation of the placenta. The three posterior positions rotated and delivered without assistance.

Most of the authors report that spontaneous delivery can be anticipated. Both Hellman and Reddoch pointed out a high percentage of failures of attempted conversions. Reddoch also stated that "versions and extraction should have no place in the delivery of face presentation except in the case of an occasional second twin." Rudolph states, and the data of the other reporters would so indicate, that cesarean section is the procedure of choice in the small percentage of patients requiring operative intervention.

Results. Maternal mortality and morbidity can be markedly increased by complicated vaginal manipulation. Several deaths are reported in the literature. Uterine ruptures associated with combined podalic version and lower genital tract trauma from extensive, and often forceful, vaginal manipulation are also reported. In our patients there was one instance of pyelitis and six minor temperature elevations in primigravid patients and one instance of cystitis and one minor temperature elevation in multigravida.

Fetal mortality has been generally reported between 15 and 25 per cent. In our series there was one ante partum death (in a primigravida) for which no cause was found clinically or at post mortem. One other baby died intra partum from compression of the umbilical cord. In our multigravida, there were two deaths from anencephaly, one death from premature separation of the placenta, and two deaths (at three days) from pneumonia. No death, save possibly that caused by cord compression, would seem to have been due to malpresentation.

Conclusions.

1. The etiology of face presentation, except for the obvious factor of anencephaly and anterior neck masses (thyroid tumor or interposed upper extremities) is not too clear.

2. The clinical course of labor, as demonstrated by the reports in the literature and our own material, will not be markedly different than for occiput presentations.

3. Chin posterior, as taught long ago, will almost never fail to rotate anteriorly and deliver spontaneously if given an opportunity to do so.

4. Combined podalic version should have no place (except in second twins) in the management of this presentation.

5. Attempts at conversion are unnecessary and are apt to fail.

6. In the event that operative delivery seems nec-

essary (a small minority) cesarean section is the procedure of choice.

Compound Presentation

Compound presentation (usually occiput presentation with prolapsed hand) is the rarest of all presentations. We would list nine such cases with two others in second twins, and one instance in a patient admitted after 60 hours in labor and multiple attempts at delivery in another hospital. It seemed to us, from incomplete data, that the hand had been pulled down by the manipulations. This patient had a dead fetus, which we delivered by craniotomy. She had pre-eclamptic toxemia and developed puerperal endometritis, but she recovered. The two examples in second twins were delivered successfully by combined podalic version.

The other nine cases present an interesting picture. Five of the nine had fetuses varying from 1,010 grams to 1,775 grams: No. 1, 1,010 grams, normal labor, died in a few hours from intracranial hemorrhage; No. 2, 1,100 grams, normal labor, normal baby; No. 3, 1,280 grams, prolapsed cord, died in three hours; No. 4, 1,720 grams, ante partum death, placenta previa; No. 5, 1,775 grams, ante partum death due to premature rupture of membranes and prolapsed cord.

Four instances only have been observed at term. In one case, a cesarean section was done early in labor because of a prolapsed cord, with successful delivery of a 3,380 gram infant. The other three (2,985, 3,050, and 3,320 grams) were delivered spontaneously after short and perfectly normal labors. One of these three infants had a considerable necrosis and slough of the forearm tissues, which healed slowly and resulted in some contracture (no subsequent follow-up).

It would seem that compound presentation does constitute an infrequent problem, and we have little concept of its importance.

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Cerebrovascular Disease

Medical Management of Thrombotic and Embolic Lesions

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Cerebrovascular diseases rank among the major causes of death or disability in the western world today. Unfortunately, they affect not only the aged but also many individuals in the middle decades of life. Twenty-five to 50 per cent of all "strokes" occur in persons below the age of 65.^{1, 2}

In the past, cerebrovascular accidents were treated in an expectant manner with a somewhat fatalistic attitude. It is true that little can be done to alter the high immediate mortality following cerebral hemorrhage, although an occasional selected case may be salvaged by surgical intervention. Recently encouraging results have been observed in the management of cerebrovascular diseases with anticoagulants. The subsequent discussion deals primarily with this latter group of cases.

Etiologic and Pathologic Considerations

About one-half of all cerebrovascular accidents are hemorrhagic. Another 40 per cent are due to thrombosis, and the remaining 10 per cent are due to cerebral embolism.³

Cerebral thrombosis seldom forms except where there is atherosclerosis. The large arteries at the base of the brain are involved earliest and most severely by atherosclerosis, especially at points where arteries bifurcate, branch, or curve sharply.⁴

Several factors predispose to cerebral thrombosis. Systemic hypotension may decrease cerebral blood flow and precipitate thrombosis during surgical anesthesia, in shock from hemorrhage or acute myocardial infarction, and occasionally in elderly persons following the drastic reduction of blood pressure with hypotensive drugs. Marked hemoconcentration resulting from dehydration, massive diuresis, or shock may so increase blood viscosity as to promote thrombosis.

Cerebral embolism usually originates from a mural thrombus in the left side of the heart. At least one-third or more of patients with acute myocardial infarcts who have not received prophylactic anticoagulants form mural thrombi in the left ventricle, especially in the presence of a large infarct, co-existing shock, or congestive cardiac failure.⁵ Thromboembolic cerebrovascular lesions were found at autopsy

in approximately 10 per cent of 210 cases of acute myocardial infarction studied by one of us.⁶

Left atrial mural thrombi are common in rheumatic mitral valvular disease, particularly when there is auricular fibrillation or congestive cardiac failure.⁷ In a study of 194 patients with rheumatic heart disease and systemic arterial embolization, Daly and his associates found 64 deaths from cerebral embolism.⁸

Bacterial endocarditis involving the aortic or mitral valves is often the source of multiple arterial embolizations. Many such emboli are septic and may result in the formation of a brain abscess in the case of cerebral embolism.

The general clinical picture of thrombo-embolic cerebrovascular diseases has been discussed, emphasizing the differential diagnosis from cerebral hemorrhage and from intracranial neoplasms.

The syndromes of intermittent insufficiency of the basilar arterial system and of the internal carotid arterial system are briefly described.

The medical management of certain cerebrovascular lesions with anticoagulants and vasodilating drugs is discussed.

The extent of damage to the brain after cerebrovascular occlusion depends upon the adequacy of collateral circulation, upon intracerebral blood pressure and blood flow, and upon the speed with which occlusion has occurred. Gradual closure of a cerebral artery may allow more chance for collateral channels to be opened than if occlusion has been sudden and complete. Severe arteriospasm may follow sudden peripheral arterial occlusion. Insufficient evidence exists to assess the importance of arteriospasm in the brain following cerebrovascular occlusion, although certain pharmacologic agents are known to increase cerebral blood flow, presumably by vasodilatation.

Clinical Picture and Differential Diagnosis

When anticoagulant therapy of cerebrovascular accidents is considered, it is essential to distinguish

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TABLE I
DIFFERENTIAL DIAGNOSIS OF CEREBROVASCULAR ACCIDENTS

| | <i>Hemorrhage</i> | <i>Thrombosis</i> | <i>Embolism</i> |
|---------------------------|--|--|---|
| Onset | Sudden, often after exertion, or during day | Often gradual, at night, or after episode of hypotension | Sudden |
| Associated Hypertension | 95% Hypertensive | 75% of CVA's in normotensives are thrombotic | Hypertension only coincidental |
| Associated Heart Disease | May have hypertensive heart disease | Common, but not usually causative | Usually mitral stenosis or myocardial infarct |
| Headache | 65% of Cases | 5-10% of Cases | 25% of Cases |
| Vomiting | 50% of Cases | 5-10% of Cases | 25% of Cases |
| Convulsions | 20% of Cases | 5% of Cases | 5-10% of Cases |
| Coma | Frequent, often progressive | Less common, often transient | Less common, usually transient |
| Stiff Neck | Often severe | Rare | Rare |
| Neurologic Signs | Diffuse, severe, often progressive | Hemiparesis most common | Discrete, localized signs |
| Leukocytosis | Often marked | Rarely severe | Rarely severe |
| Glycosuria | Often with intracranial pressure increased | Seldom in non-diabetic | Seldom in non-diabetic |
| Cerebrospinal Fluid (CSF) | Pressure often high, bloody or xanthochromic 85% | Pressure normal Fluid clear usually | Pressure normal Fluid clear usually |

hemorrhage from thrombo-embolism, since these agents may aggravate hemorrhage. Usually the diagnosis of hemorrhage is not difficult; occasionally, however, absolute clinical differentiation may be impossible. The principal differential features of the three major types of vascular lesions are summarized in Table I.

If there is any doubt concerning the exact nature of a cerebrovascular accident, a lumbar puncture should be performed and the cerebrospinal fluid examined. This examination should be performed in every case in which anticoagulant therapy is anticipated to exclude the probability of hemorrhage. Some authorities have warned against doing lumbar punctures in cases of cerebral hemorrhage showing signs of increased intracranial pressure because of the alleged danger of causing herniation of the uncus or brain stem. Usually the diagnosis of hemorrhage in such a patient is so obvious that lumbar puncture is unnecessary; however, minimal danger exists if the examiner avoids multiple penetrations of the dura, uses a small needle, and withdraws slowly only 5 ml. of fluid. If the cerebrospinal fluid specimen is bloody, it should be centrifuged and the supernatant fluid examined. The supernatant fluid becomes bloody

within a few hours after a hemorrhage, while if the bleeding is due to a traumatic puncture, the supernatant fluid will be clear.

The focal neurologic signs produced by cerebrovascular accidents are dependent upon the areas of the brain affected and do not differ from the signs caused by non-vascular lesions in the same locations. In general, the neurologic signs of cerebrovascular lesions are fully developed within the space of a few hours or days at the most, whereas the signs of intracranial neoplasms tend to develop gradually and progressively over a much longer period.

When the cerebrospinal fluid protein level is 100 mg. per cent or more, the diagnosis of an intracranial neoplasm is heavily favored. Hemorrhage into the subarachnoid space will increase the cerebrospinal fluid protein content. The true concentration of cerebrospinal fluid protein may be roughly calculated by deducting 1 mg. per cent for each 750 erythrocytes per cu. mm.

Some of the cerebrovascular syndromes are manifested by transient signs occurring over periods of weeks to months closely simulating the symptoms of expanding intracranial masses, especially if there are convulsive episodes. Absence of phenomena in-

duced by increasing intracranial pressure such as tonic or clonic seizures, altered consciousness, radiographic or electroencephalographic changes, tends to exclude the probability of expanding intracranial masses. If other means have not clearly delineated the diagnosis, cerebral arteriography should be performed.

There are two cerebrovascular syndromes which experience has shown are particularly responsive to anticoagulant therapy, namely, the syndromes of intermittent insufficiency of the basilar arterial system^{9, 10} and of the internal carotid arterial system.^{11, 12}

The basilar arterial system distributes blood to the brain stem and to the occipital lobes via the posterior cerebral arteries. Characteristically the syndrome of basilar arterial insufficiency is manifested by a variety of neurologic symptoms occurring in sharply episodic attacks as listed below:

1. Transient visual symptoms—homonymous field defects, diplopia, ptosis
2. Temporary mental confusion, clouding, or loss of consciousness
3. Attacks of true vertigo
4. Transient disturbances of speech
5. Dysphagia
6. Episodes of vomiting and headache
7. Transient hemiparesis or hemiplegia
8. Transient sensory phenomena involving one side of the face, one extremity, or one-half of the body.

The diagnosis should be considered especially when any of the symptoms listed occur on different sides of the body during different attacks: e.g., hemiparesis on the left side of the body in one attack and on the right side of the body in a subsequent attack.

The internal carotid arterial system transports most of the blood supply to the ophthalmic arteries and to the cerebral hemispheres excepting the occipital lobes. The symptoms of internal carotid insufficiency are usually those of episodic, homolateral disturbances of vision associated with transient motor or sensory dysfunction on the contralateral side of the body. The principal manifestations of internal carotid insufficiency are listed below:

1. Transient visual disturbances—monocular loss of vision on same side as the lesion
2. Cerebral hemispheric disturbances—manifested on the side of the body opposite to the lesion
 - a. Transient hemiparesis or hemiplegia
 - b. Transient sensory phenomena in the face or extremities
 - c. Focal or generalized epileptic seizures
 - d. Periods of mental confusion or unconsciousness.

Occasionally it is possible to demonstrate the

absence of an internal carotid pulse by inserting a finger into the postero-lateral pharynx, which of course aids the diagnosis. Usually this method is difficult and unreliable. If there is any reasonable doubt concerning the diagnosis, a cerebral arteriogram should be done.

Treatment

The anticoagulant drugs appear to be the most effective agents in the prophylaxis and treatment of thrombo-embolic cerebrovascular disease. Long-term studies by several authors^{2, 10, 12, 13} have demonstrated that properly controlled anticoagulant therapy will usually prevent the formation or propagation of thrombo-embolic lesions in the cerebral vessels. There is some evidence to suggest that these agents will also promote recanalization of existing thrombi.¹³

At present, the indications for the use of anticoagulants in the treatment of cerebrovascular disease¹⁴ are:

1. Recurrent cerebral emboli
2. Intermittent insufficiency or thrombosis of the basilar arterial system
3. Intermittent insufficiency or thrombosis of the internal carotid arterial system
4. Possibly for recurrent cerebral thrombosis elsewhere in the brain.

Effective, safe anticoagulant therapy requires the availability of a competent laboratory equipped to perform accurate prothrombin and clotting times; an alert physician who is well informed in the use of these agents; and a reasonably intelligent, cooperative patient. Anticoagulant administration is absolutely contraindicated in the presence of bleeding anywhere in the body and particularly if there is cerebral hemorrhage.

Heparin is generally given during the first two or three days because of the rapid onset of its anticoagulant effect. Daily measurement of the venous clotting time should be done when heparin is used, the optimum level being between 20 and 30 minutes. Therapeutic effects are usually obtained by the intravenous administration of 50 mg. crystalline heparin every three to four hours.

We seldom use the so-called depot-heparins because we have found difficulty in maintaining the clotting time within the limits defined with these preparations. Recently a concentrated crystalline preparation of heparin containing 200 mg. per ml. has become available. Limited experience with this product has been gratifying in that we have usually been able to maintain the clotting time in the therapeutic range with an intramuscular dose of 75 to 150 mg. every 12 hours. Each individual patient's dose must be assayed. Heparin administration is discontinued whenever the prothrombin level has

been adequately reduced by the use of other delayed action agents.

Administration of the longer-acting prothrombin depressing drugs is begun concurrently with the first dose of heparin. For at least the first two weeks of therapy, the prothrombin time should be measured daily. Safe therapeutic levels of the prothrombin time are between 10 and 30 per cent (or, if reported in seconds, the patient's time should be $2\frac{1}{2}$ times the control time). Ethyl biscoumacetate (Tromexan®) effectively reduces prothrombin activity within 24 to 36 hours, and the patient is often given one dose of 900 to 1,200 mg. to depress the prothrombin level while waiting for the activity of bishydroxycoumarin (Dicumarol®) to become evident.

Dicumarol is the drug we prefer for long-term use, although there are numerous others which appear to be equally as effective. The average initial oral dose of Dicumarol® is 300 mg. to be followed by 200 mg. on the second day and often by 100 mg. on the third day. Subsequent daily maintenance doses usually vary from 25 to 75 mg.

After the patient has been stabilized on Dicumarol® therapy in the hospital for about two weeks, it is generally possible to determine an average daily dose, following which the patient may be sent home. His prothrombin time can be measured at weekly intervals on an out-patient basis. Such a patient must be carefully instructed to report immediately any hemorrhagic tendencies such as epistaxis, purpura, or ecchymosis, hematuria, melena, etc. This treatment should be continued indefinitely in the patient with thrombo-embolic cerebrovascular disease. We have observed several such patients who stopped their anticoagulants for various reasons and shortly thereafter experienced recurrence of symptoms.

Once the existence of cerebrovascular insufficiency or occlusion has been established, it is desirable to stimulate increased cerebral blood flow as well as to prevent further intravascular coagulation. Only two pharmacologic agents are known to increase cerebral blood flow. Inhalations of carbon dioxide 5 per cent with oxygen 95 per cent may increase blood flow through the brain by as much as 75 per cent. Frequently it is administered to the patient by face mask five or ten minutes every hour during the day.

Increases of cerebral blood flow up to 20 per cent have been observed with use of papaverine.

This drug is usually given subcutaneously 30 to 60 mg. every six hours, or its synthetic counterpart, dioxylone phosphate (Paveril®) is given orally 100 to 200 mg. every six hours. Despite its popularity, nicotinic acid has no effect on human cerebral blood flow, and two other frequently used drugs, aminophyllin and caffeine, may actually reduce cerebral blood flow.

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Laws have their proper place, but the responsibility of worthy citizenship is a personal one. We each have a separate and individual share in eradicating social evils and in refusing to perpetuate practices odious to a free nation.

—Herbert Brownell, Jr.

Respiratory Insufficiency

A Grave Problem in Newborn Infants

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Severe respiratory insufficiency in newborn infants is not an infrequent occurrence, especially among premature infants. Almost all of the deaths during the first week after birth are the result of respiratory insufficiency, caused either by cerebral disturbances or abnormal conditions in the respiratory tract.

Clinical methods for grading the degree of respiratory insufficiency in newborn infants have not been accurate. Attempts to evaluate the amount of cyanosis, dyspnea, hypotonia, or edema by clinical methods have been fraught with error, because of the large subjective element necessarily involved.

An explanation is given for high morbidity and mortality rates, along with an explanation of aberrations in respiratory rates, in infants afflicted with respiratory insufficiency. The plan of therapy at the University of Kansas Medical Center is outlined.

Recent studies in this clinic indicate that newborn infants can be classified as normal or as having mild or severe respiratory insufficiency by determining the course of the respiratory rate beginning at birth and continuing for the next two or three days.^{1, 2} Classification by this method helps not only in predicting survival but also in planning oxygen therapy. The need for careful use of oxygen in the treatment of neonatal respiratory insufficiency in small premature infants has again been recently emphasized, in order that the severe consequences of retrolental fibroplasia may be kept at a minimum.³

Respiratory rates in newborn infants can be classified into three groups according to their trends. Group I includes infants who breathe at a rate of approximately 40 per minute at birth and continue to breathe at about this rate throughout the neonatal course. Infants in Group II breathe at a high rate initially, and then the rate falls to normal levels during the next day or two and remains there. No infants in this clinic belonging to Groups I and II have needed oxygen

therapy or died, irrespective of how little or how much they weighed at birth.

Infants in Group III often demonstrate severe degrees of respiratory insufficiency. Their respiratory rates may be low, normal, or high right after birth, but in every instance there is a significant increase in respiratory rate sometime during the first 48 hours. In this clinic about 50 per cent of the infants in Group III have required oxygen therapy, and about 25 per cent have died during the early neonatal period.

The explanation for the three trends of the respiratory rate described above and for the high morbidity and mortality observed among infants in Group III is to be found in part in studies done on the physiology of neonatal respiration. Resting tidal volumes apparently are greater among infants in respiratory Groups I and II than in Group III.⁴ The larger tidal volumes among infants in Groups I and II suggest a more rapid expansion of their lungs and probably account for the fact these infants are able to attain satisfactory saturation of their blood with oxygen a few minutes after birth and to overcome any tendency to respiratory acidosis within two or three hours of their birth.⁵ Conversely the low resting tidal volumes observed among infants in Group III suggest a poor expansion of their lungs, a fact borne out by post-mortem examination, and also help explain why some of these infants are unable to saturate their blood satisfactorily with oxygen the first day or two and tend to have a marked respiratory acidosis. Some of these infants occasionally have increases in the tension of carbon dioxide and decreases in the pH of their blood that are alarming.^{6, 7}

The combination of respiratory acidosis and hypoxemia in the newborn infant is interesting because hypoxia apparently does not act to stimulate respiration in this age group as it does later in life. In fact moderate hypoxia appears to depress the newborn infant.^{8, 9} The depressing effects of moderate hypoxemia would explain why some newborn infants, especially premature infants, have apnea and bradypnea immediately following birth.¹⁰ As the hypoxemia becomes less, the stimulating effect of an increase in tension of carbon dioxide would very likely make itself felt, thus perhaps accounting for the increase in respiratory rates in infants belonging to Group III.

The above explanation satisfactorily accounts for

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the aberrations in the respiratory rates seen during the first day or two among infants in Group III. However, the problem confronting these infants is more complex than described above. In order to facilitate the explanation of their respiratory difficulty, the course of events has been schematically represented (Figure 1). This schematic presentation is based on studies done in this clinic. The presumed course of events for a hypothetical infant in Group III has been compared with that of a hypothetical normal infant (Group I).

The point to be emphasized is that infants in Group III can recover from the initial respiratory difficulties of the first day or two. Their respiratory rates decline to normal levels; their blood is well saturated with oxygen; acid-base balance becomes normally adjusted. The infants often appear clinically well. Actually many of them are not, and a considerable proportion eventually die before the end of the first week, especially those who weigh less than 1,750 grams at birth.

The explanation seems to lie in the fact that although they appear to have recovered fully, their lungs remain only partly expanded. Measurements of resting tidal volumes continue to be low throughout the first week and often extending into the second week. As shown in the graph, their recovery comes about in spite of the fact their tidal volumes do not appreciably increase. Their improvement presumably takes place because of a relative increase in effective alveolar ventilatory space and decrease in dead space.¹¹ It is also possible that some improvement occurs in the diffusion of gases across the alveolar wall as the

result of changes in the wall itself. In any case the tidal volume apparently increases but little.

These infants remain in jeopardy so long as their tidal volumes remain small, since very little encroachment on the tidal air space would be required to tip the scales against them. Usually it is the small premature infants who are most apt to get into serious difficulties during this period of apparent recovery. The difficulties often come suddenly and without warning in the form of severe bradypnea and apnea. If the infant dies during this period, autopsy may show a cerebral hemorrhage several days old, evidences of pneumonia and rather marked atelectasis, kernicterus, or sepsis. It is easy to believe that any one of these findings could tip the balance against the infant. What is difficult to explain is how some of these infants can appear to be so well during the so-called recovery period.

One additional fact is pertinent. Gross irregularities of respiratory rhythm characterize the breathing of premature infants during this recovery period. The cause of the irregularity is not known. The infants who die seem to be those with the greatest irregularities in rhythm as determined by measurements of the periods of apnea.¹² Some warning of impending disaster can be obtained by noting the length of the periods of apnea from which the infants recover spontaneously. If these periods exceed 30 seconds, the infant is in grave danger of having a more prolonged period of apnea from which recovery may not occur.

Any newborn infant may develop respiratory insufficiency. In this clinic the incidence of severe respiratory difficulty is comparatively low among infants with birth weights over 1,750 grams.¹⁰ About 80 per cent of infants in this clinic who weigh between 1,001 and 1,750 grams can be expected to have severe respiratory insufficiency.

Individual respiratory records are kept on all premature infants in this hospital and on any full term infant thought likely to have trouble until all danger is past. The record starts at birth, and the respiratory rate is counted for a full minute every 15 minutes during the first hour, every two hours for the next 47 hours, and every four hours for the next two days. More frequent observations are made on critically ill infants and are continued for as many days as thought desirable. Respiratory rates obtained on restless and crying infants are discarded except during the first hour, when some restlessness is almost universal.

Particular attention is paid to the records of infants weighing less than 1,750 grams at birth. This is the group that has a high incidence of respiratory insufficiency and also is the group most likely to suffer from too much or too little oxygen therapy. Experience in this clinic has shown that if infants under

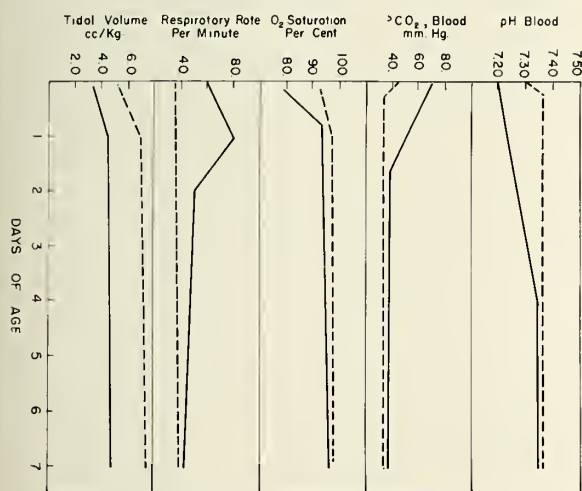


Figure 1. Changes in respiration, blood-gas determinations and pH of blood in a hypothetical infant with respiratory insufficiency (Group III)—— compared with those in a hypothetical normal infant (Group I)-----.

1,750 grams do not initiate sustained, spontaneous respirations within two minutes of birth, or do not attain a respiratory rate of 40 or more per minute during the first hour, they invariably develop significant increases in their respiratory rates and have a mortality of at least 50 per cent.

Observations on the trend of the respiratory rate have been helpful in planning oxygen therapy in this clinic. We believe oxygen therapy can be safely withheld from infants who weigh less than 1,750 grams at birth provided that they (1) are free of cyanosis within a few minutes of birth, (2) initiate sustained, spontaneous respirations within two minutes of birth, (3) attain a respiratory rate of 40 or more per minute in the first hour, and (4) do not have a significant increase in respiratory rates after the first hour. Concentrations of oxygen are kept at 40 per cent or less for infants needing oxygen therapy.

Concern over the production of retrolental fibroplasia by prolonged oxygen therapy or too high concentrations of oxygen is much less among infants who weigh more than 1,750 grams at birth. These infants receive oxygen therapy if they are cyanotic. Cyanosis is seen only in those who have significant increases in respiratory rates.

Indications for starting oxygen therapy are far more definite than those for discontinuing it. Small premature infants belonging to Group III are prone to develop severe apnea and bradypnea suddenly and unexpectedly even though they appear to have recovered from their initial respiratory difficulties of the first day or two. Criteria for ending oxygen therapy will continue to be indefinite for small premature infants until more reliable means have been found for

predicting these sudden bouts of prolonged apnea and severe bradypnea.

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America can continue to be the source of emotional and moral strength for the world on one condition. That condition is that this nation stays prosperous, progressive, civilized; that our program of justice moves progressively forward; that we continue to reduce the areas of injustice within our borders. The great challenge of the century is to find ways and means of extending a practical program of justice to the farthest reaches of the world.

—William O. Douglas

Anorexia Nervosa

A Study of Residential Treatment

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Residential treatment affords singular opportunity for the study and validation of basic psychopathology in emotionally disturbed children, and it also serves to clarify the dynamics of psychologically determined illnesses. The utilization of this approach resulted in the successful therapy of two children with anorexia nervosa (compulsion feeding neurosis) and in the uncovering of core fantasies undergirding their illnesses.

The psychological concomitants of this disease have long been recognized. Morton,¹ in 1694, referred to this "consumption of mental origin." Much later Sir William W. Gull described emaciation "to the last degree through hysteric aepsia."² He then presented the classic description of what he termed "anorexia nervosa," characterized by repugnance to food, extreme emaciation, amenorrhea, and personality changes.³

It remained for modern workers to describe the specific personality changes most frequently encountered. Their reports hold this illness to be a graphic illustration of the influence of emotion on bodily functions and indicate that it is primarily a psychological disturbance with physiologic concomitants, rather than the reverse.⁴ Additional investigations underscored the basic anxiety and depression to be found and especially emphasized the compulsive obsessive features.⁵ Actual loss of appetite was demonstrated as a rare occurrence; rather, the individuals do not eat because they are afraid to eat.⁶ The term anorexia is, therefore, inappropriate, and the newer term, compulsion feeding neurosis, rapidly evolved.⁷

More currently there has been an interest in observation and treatment of individuals with this illness in medical hospital settings which are reinforced with psychiatric orientation. In severe cases, life is so threatened that management outside of a hospital is ill advised, and extreme care and attention to every facet of the illness is imperative if life is to be saved. All of these observations emphasize the difficulties that are encountered in daily management because of the psychological limitations of the ill individual to respond to the regime, and, in addition, because of

the limited psychiatric facilities of medical wards.⁸ Large series of patients have been studied, and only in rare instances have basic fantasies been uncovered.⁹

This study was carried out in the Children's Residential Treatment Center of the Neuropsychiatric Institute of the University of Michigan, a children's psychiatric ward in a general medical hospital setting. It is a unit of 20 beds, and the children who are patients range in age from 6 to 14. The program is administered by a staff of nurses trained in residential treatment methods. School, occupational therapy, recreational therapy, and special reading opportunities are incorporated in the ward experience of each child.

A brief history of the evolution of current thinking in regard to compulsion feeding neurosis is attempted. Early awareness of psychologic concomitants of the illness and the modern work of specific study of personality changes are traced. Hospital management of this illness is presented, particularly children's residential treatment in a general hospital setting. Two cases are discussed to illustrate treatment of underlying impregnation fantasies.

The keystone of treatment is individual psychotherapy. Every effort is made to coordinate and integrate every ward function so that the individual psychotherapeutic experience is nurtured and strengthened. Frequent group and single staff conferences are employed to achieve this goal.

Two children with compulsion feeding neurosis were treated in this setting. One was hospitalized for a period of nine months, the other for a period of eight days. Through their response to treatment, they illustrate the value of both long- and short-term stays in a children's psychiatric ward of a general hospital.

Case Reports

Case 1: Robin P. D., age 12, began having difficulty following a tonsillectomy performed in October, 1950. There had been a gradual diminution of his appetite and eating shortly before this time, but the problem assumed major proportions following the surgical procedure. At school the boy displayed in-

Presented in a "Workshop on Anorexia Nervosa" at the 1956 annual meeting of the American Orthopsychiatric Association. Dr. Gianakon is assistant professor of psychiatry and pediatrics and director of the Child Study Unit at the University of Kansas Medical Center.

creasing weakness and inability to keep up with his studies. School authorities became extremely concerned when the boy would collapse in a limp fashion on the floor of the classroom.

A physician was consulted and informed the parents that Robin was suffering from a "small stomach ulcer." Following several weeks of Sippy diet treatment the boy was pronounced well, but the family noted no improvement in his condition. He was so weak that he was unable to go to school. He remained in bed and even was using a bed-pan for fear that he would collapse on his way to the bathroom. He was drinking a glass of milk daily, and this was the extent of his food intake. Concomitantly, the boy's behavior became extremely negativistic. He refused to speak to the other members of his family and would persist in "passive aggravation" in his relationship with his father. Finally the father insisted that the boy be removed from the home, and it was at this time that Robin was taken to the Children's Residential Center at the University of Michigan, in November, 1951.

The family history indicated that Robin's mother was suffering from a paranoid psychosis at the time of her marriage. Her illness had persisted throughout Robin's lifetime. The family had observed the mother during periods of hallucination when she would become quarrelsome toward imagined "union leaders" who, she felt, were plotting harm to her. Apparently Robin accepted this state of affairs without great question. When he was six years of age, the mother was confined to bed when she was discovered to have tuberculosis. She received pneumothorax treatment regularly, and this had been discontinued only during the year before Robin's hospital admission.

Until his illness, the boy slept with his mother. She insisted upon bathing him. Later he had objected to this and would allow her to wash only portions of his body. The boy had minimal contact with his father who would not come home from work until late at night, who slept in a separate bedroom, and who was gone early in the morning. The family gave the impression that the relationship with the father had been most noticeable since the boy's illness when his extreme negative teasing of the father became pronounced.

Laboratory data: Complete gastrointestinal x-rays failed to reveal the presence of an ulcer or any evidence that it had ever existed. Blood studies indicated hemoglobin of 85 per cent, nonprotein nitrogen of 40 mg. per cent, total serum cholesterol of 117 per cent. The basal metabolic rate was plus 6 per cent. Chest x-ray was negative. Skull plates and ophthalmologic examination were negative. Psychologic testing revealed a "neurotic boy of potentially superior intelli-

gence whose conflict is based on ambivalence concerning the expression of aggression and identification with males."

The course in the hospital was characterized, at first, by a continuation of his eating difficulties. He weighed 93 pounds on admission. He was almost totally non-verbal in his psychotherapeutic interviews and seemed to have great difficulty in forming positive relationships on the ward. There were reports of sex play with another boy on the ward. Following this, Robin had two "panic attacks" in which he became prostrate and manifested profound autonomic changes. He then confided that these were brought on following intense excitement due to sexual preoccupations with other children. On one of these occasions he had become stimulated in the occupational therapy shop as he watched one of the children working with a woodburning set. Accidentally Robin was burned slightly, and he became panic stricken when he felt that this had befallen him as a punishment for his thoughts.

When this episode was reviewed with him, he was able to verbalize his conception of sex and reproduction (Figure 1). He stated that everyone "had a baby inside." This baby remained quiet until one was in the presence of a "liked" person. In his thinking, this was substantiated by the fact that women who

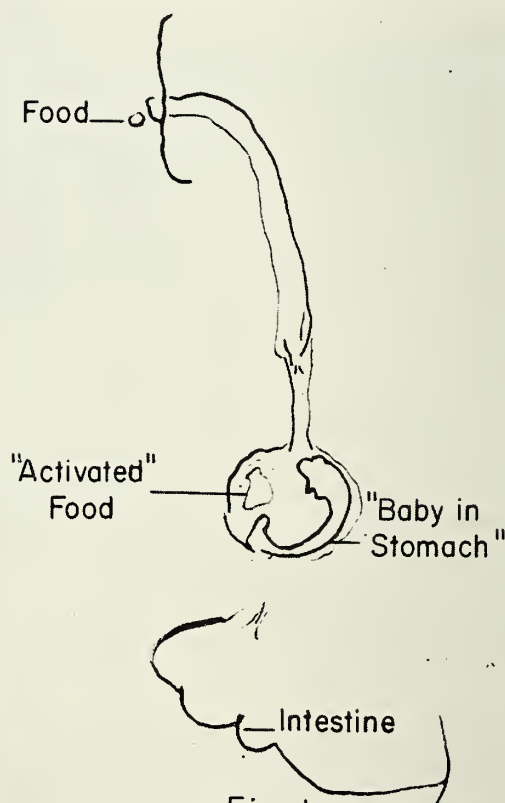


Fig. 1

had babies were usually married to someone they liked, although he realized this was not an imperative requirement. It was his feeling that the baby was activated by the ingestion of food. Food particles would be contaminated with "germs or something" of the "liked" person, and the baby would be activated. He was aware of the fact that men do not have babies. Yet, he felt, the process was very much the same. When the contaminated food was eaten by a man in the presence of someone who liked him, the "germs" would act on the stomach and form a "sore."

His fears were underscored when the consulting physician told his parents that Robin had a "small stomach ulcer." He recalled the tremendous anxiety he experienced then and his inability to discuss it with his parents. Subsequently he spontaneously asserted that there were two factors which had kept him from eating. First was the fantasy he had outlined. Second, he stated that he had not eaten solid food for two years and because he had gone without it for so long he was frightened that he would never be able to eat again.

In later interviews the boy disclosed a disturbed sexual relationship with his mother and confided that there had been considerable genital manipulation during the years in which he had slept with her.

All this while, the boy had been making a primary relationship with one of the attendants on the ward. The boy would immediately test the interpretations and insights gained in his interviews by applying them in this new found relationship. He would often request reassurance in the gradual formation of new attitudes. A consistency of approach was achieved by close association of the therapist and attendant. The boy became enthusiastically motivated in his social pursuits, and his eating gradually improved so that he was able to eat even in public restaurants without anxiety.

The parents were gratified by the boy's response and were cooperative in the formation of plans for Robin upon his discharge. Although of moderate circumstances, they agreed to Robin's placement in a midwestern private school. He has made a satisfactory adjustment there and his academic work has been of such quality as to make him an honor student. Although there are obviously continuing emotional difficulties, he is now able to maintain improvement with only an occasional out-patient visit.

Discussion: The neurotic symbolization of pregnancy fantasy through the gastrointestinal tract is obvious and needs no further elucidation. There appears to be confirmation, in Robin's history and treatment course, of the generally accepted theories that the primary gains received by the rejection of food are: (1) reluctance to mature and face adult respon-

sibilities, (2) diminution and elimination of sexual desire through malnutrition which slows all biological processes, and (3) solution to a conflict with parents, with a masochistic device of atonement for the guilt that is aroused by this conflict.¹⁰ In addition, the multi-phasic nature of symptoms is revealed. Symptoms may continue after the initial precipitating conflict has become secondary. The compulsion of habit may reinforce the symptoms and wreak further handicap on a weakened personality structure.

In treatment, the advantage of being associated with a general medical hospital seems clear. Parents, even if psychotic, first consult the medical physician when their child is ill. In Robin's case the initial contact with a physician was unfortunate and served to crystallize the boy's fantasy. Thus, an "iatrogenic" factor was added to the illness. This could best be resolved in a medical setting where the boy's cachexia could be overcome and where faulty diagnostic evaluations could be corrected.

The necessity for close staff integration is emphasized.¹¹ The importance accorded to every staff member's role increases the sense of participation and consequent enthusiasm for a common effort. A primary relationship was established by Robin for the ward attendant. The boy was immediately able to utilize and validate the insights gained in therapy and was confronted by a consistent and reassuring response at every test. The incorporation of ward reports and behavior in therapy made possible "on-the-spot" techniques¹² which facilitated his progress.

Chronologic maturation during residential treatment probably contributes to an improvement in relationship to the parents. The period of separation frees both child and parent from the over-burden of home adjustment, and the parents gain pride, prestige, and positive attitudes when the child can present his newly acquired achievements, behavior, and attitudes.¹³

Case 2: Dianne H., age 12, was a plump child, weighing 138 pounds. She began to have eating difficulties during the spring of 1951, when her mother became ill. Dianne had to assume some of the responsibilities of housework and waited on and cared for her mother while she was in bed. Because of the irregularity of the meals during this time and the fact that the mother was not able to prepare them as she formerly had, the family felt no undue concern over Dianne's eating problem. However, Dianne's refusal to eat continued after her mother's recovery.

At first Dianne would attempt no explanation for her eating habits, except to state that she was not hungry. Later she informed her mother that some of the boys in her school had been teasing her about her weight and she wished to go on a diet to become more

physically appealing. She lost weight steadily and progressively and had to be hospitalized on several occasions. On admission to the University of Michigan Hospital she weighed 86 pounds.

Her history indicated that Dianne had been indulged by her family. She had always been a submissive child and had never posed a disciplinary problem of any proportion. She had been a good student in school and had always exerted herself maximally. The parents' only concern was Dianne's difficulty in social relationships. It was obvious that the mother was the dominant person in the family. This was indicated by such facts as the mother's insistence that she do all the driving of the family automobile. Dianne seemed much attached to her father, although the contact with him was minimal.

Laboratory data: Examination of the blood revealed the following: 12.7 gms. hemoglobin, sedimentation rate 17 mm. per hour, and hematocrit 38 per cent. Serum cholesterol was 360 mgs. per cent. Chest x-ray was negative. Psychologic testing revealed "a distorted relationship and identification with the parents, with constriction and depression."

The hospital course was characterized by a dramatic improvement in her eating habits. She was hesitant to join in group activities at first but quickly became a leader in the various ward functions. She formed a

rapid relationship to her therapist and was discharged to her home with arrangements for out-patient care. The physician in her city was advised of her condition and directed the medical regime on her return home.

During out-patient interviews Dianne told of a frightening experience which she had had shortly before the feeding difficulties began. She had felt kindness and pity for an elderly man who lived in a "shack near the tracks" and who was shunned by the majority of the people in the neighborhood. On several occasions she took this man cookies she had baked in school. On one of these times he invited her into his "shack," embraced her, and made improper advances toward her. She ran away, panic stricken, and was too frightened to report this incident to anyone. Thereafter, she became preoccupied with sexual thoughts. These were heightened by the fact that she had observed her brother several times in the nude. In discussing her concept of reproduction, she drew a diagram illustrating her belief that a baby existed inside every woman (Figure 2). Her idea was that this baby would become activated either through the passage of "something" from the mouth through the "intestine" or from the passage of "something" through the "intestine" leading from a woman's "bottom."

As therapy continued, the parents were gratified by her increased social success at school. She gained in weight to 101 pounds, and this improved her physical appearance considerably. She was elected the class homecoming queen consort. She was also elected to the post of class treasurer. She is continuing in both academic and social achievements.

Discussion: It has been pointed out that children who are eating problems at home often become good eaters in a new environment. The removal of tension which pervades the home as well as the observation of other children who eat disliked food with relish possibly contribute to this.¹⁴ Spoon feeding and intimate, personal attention at meals may be helpful.¹⁵

Although the child was admitted to the general hospital, the transfer to the Children's Psychiatric Ward quickly underscored the emotional factors of her illness for her. Each activity throughout the day was planned and purposeful and avoided her former hospital experiences of merely "sitting around from one meal to the next."¹⁶ Upon her discharge home, her local physician was able to sustain her physical improvement and was able to countenance treatment suggestions without resentment because they emanated from a medical center.

Conclusion

The study and treatment of compulsion feeding neurosis are greatly facilitated and enhanced in the

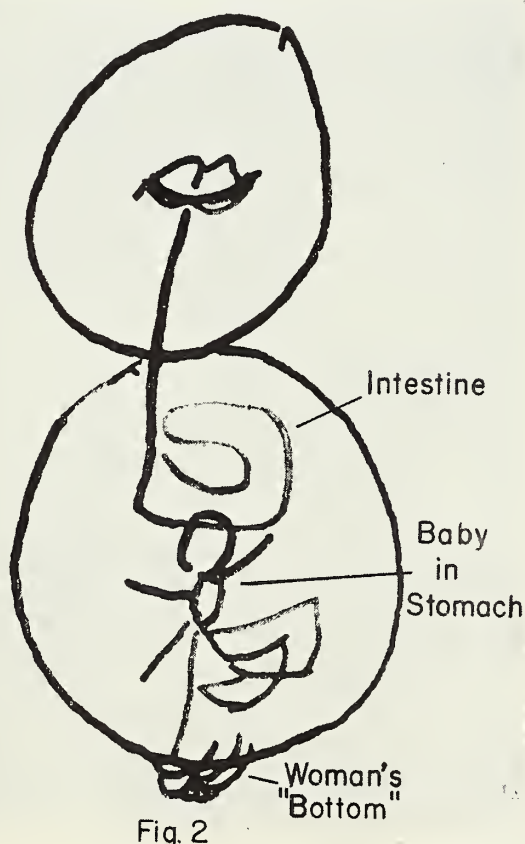


Fig. 2

setting of a Children's Psychiatric Unit of a general hospital.

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Ammonia Intoxication

The Theoretical Basis for Therapy with Arginine

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The importance of enzymatic reactions in the maintenance of life and health has become increasingly apparent in recent years. Many attempts to further elucidate the function, capacity, specificity, and other properties of enzymes are now in progress throughout the country. Transfer of the information thus gained, from the laboratory to the practicing physician, is frequently hindered by an unawareness of the properties of enzymes and their importance in human bodily economy. Illustration of how their properties have been recently applied to the therapy of ammonia intoxication is but an example of the promise such research holds for the future.

One of the most important properties of enzymes is the capacity of these biologic catalysts to operate through a wide range of activity. The magnitude or velocity of the reaction depends upon the concentration of the substance upon which the enzyme reacts—termed the substrate of the enzyme; thus, substrate concentration automatically regulates the degree of activity. The full implication of this truism has not yet been fully appreciated.

Two basic postulates apply to enzyme reactions in general and are germane to this discussion. As already indicated: (1) Enzymes can operate faster or slower, depending upon the availability of substrate, and

(2) Generally the concentration of substrate is much smaller than the enzyme concentration.

A specific example may help to clarify these basic concepts. The enzyme, alcohol dehydrogenase, is pres-

This example of the clinical application of biochemical principles to the treatment of the syndrome of portal-systemic encephalopathy is illustrative of the promise that these basic concepts hold for clinical medicine. Elucidation of more of these fundamental enzymatic processes will undoubtedly provide newer and more efficient methods of therapy for many disorders.

ent in normal liver regardless of the presence or absence of alcohol (illustrating Postulate 2). This concept is extremely important because it illustrates how bodily physiology readily adapts to changes in its environment.

However, ingestion of alcohol is followed by dehydrogenation of the alcohol by the enzyme. The velocity of this dehydrogenation reaction depends upon the amount of alcohol reaching the enzyme (illustrating Postulate 1).

Because enzymes are protein they are extremely

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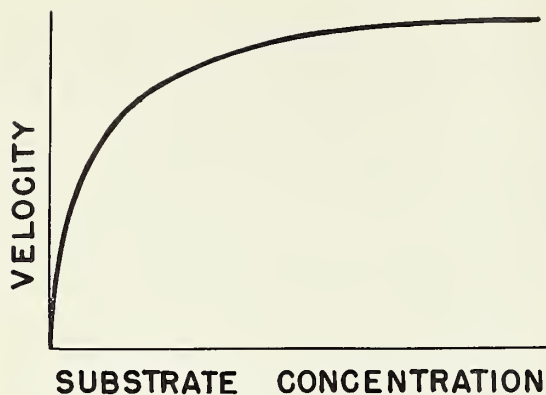


Figure 1.

complicated molecules and are but slowly synthesized by the cell. If the enzymes were operating normally near saturation, the response to increased substrate concentration would thus be limited. It would, therefore, severely restrict physiologic adaptability if the body were required to synthesize more or less enzyme according to the demands of substrate concentration.

With these fundamental concepts in mind, let us examine the clinical problem of ammonia intoxication. As is well known, ammonia is a very toxic substance, and accumulation of it in the body in excess of the ability to remove it via urea synthesis gives rise to a symptom complex which has been termed portal-systemic encephalopathy by Sheila Sherlock.

Portal-systemic encephalopathy thus arises from defective response of the body to a toxic insult. This defective adaptation may take origin from three general conditions: (1) The liver may be so injured that it is unable to remove even normal amounts of ammonia; (2) An overwhelming amount of ammonia may be presented to a moderately impaired liver, as for example with gastrointestinal bleeding, excess protein ingestion, or administration of ammonium salts; or (3) By administration of certain drugs, such as acetazoleamide, which block enzymatic pathways.

The defense of the organism to this metabolic insult may also follow one of three patterns. It may store ammonia as a non-toxic substance, such as glutamine. This possibility led to the use of mono-sodium glutamate in the treatment of ammonia intoxication. However, this mode of therapy has been disappointing, probably because of the poor permeability of the liver cell for glutamic acid¹ and the limited capacity of the body for the storage of glutamine.

A second mode of defense would be to increase the amount of healthy liver tissue and, in essence, the amount of enzymes involved in the removal of ammonia. For reasons already pointed out, this is a slow and relatively inefficient process that is inadequate in the acute situation. Moreover, protein synthesis is intimately dependent upon protein intake, and a car-

dinal rule in the treatment of ammonia intoxication is the elimination of protein from the diet.

The third, and most clinically adaptable, mode of defense is to increase the capacity of the enzymes involved in the removal of ammonia as urea. Four basic reactions are directly involved in the removal of ammonia as urea and are illustrated in Figure 2. A fifth pathway is also of indirect importance in this regard and is appended in Figure 2. The entire urea cycle and its interrelationship to the Krebs' citric acid cycle are graphically illustrated in Figure 3.

REACTIONS OF THE UREA CYCLE

1. Carbamylglutamic acid \neq NH_3 \neq CO_2 \neq ATP \rightarrow Compound X
2. Compound X \neq Ornithine \rightarrow Citrulline
3. Citrulline \neq Aspartic acid \rightarrow Arginine \neq Fumaric acid
4. Arginine \rightarrow Urea \neq Ornithine.
5. Compound X \neq Aspartic acid \rightarrow Carbamylaspartate \rightarrow Pyrimidines.

Figure 2

As may be noted, each time the cycle passes through the sequence of reactions, free ammonia is removed directly at Step 1 and indirectly via aspartic acid at Step 3.

Theoretically, according to Postulate 1, one might increase the capacity of the urea cycle for the removal of ammonia by the use of any of the substrate components of reactions 1 through 4. Greenstein et al.²⁻⁶ in a series of experiments have shown that arginine is the most effective of the agents tested. Clinical use of arginine infusions in patients suffering from portal-systemic encephalopathy has been shown to produce most favorable results by Najarian and Harper⁷ and as reported from this hospital by Manning and Delp.⁸ The effectiveness of

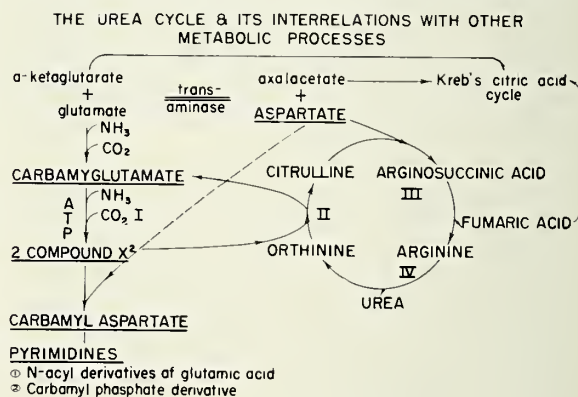


Figure 3

arginine as compared to the other possible substrates is probably because it more readily enters the hepatic cell.^{1, 9} Also, the level of arginase in the liver is considerably higher than any of the other enzymes involved in the biosynthesis of urea.¹⁰

One other component of the urea cycle in mammals, carbamylglutamic acid, may also prove to be an efficient therapeutic agent. In experiments conducted by Dr. D. P. Wallach at the Upjohn Laboratories, carbamylglutamate acted efficiently in preventing ammonia intoxication, although not as well as arginine in acute experiments.¹¹ The effectiveness of this compound is limited by the fact that ornithine (the product of arginine therapy) has a much greater affinity for the enzymes of Step 2 than carbamylglutamate does for the enzymes of Step 1.^{12, 15} Although this affinity has not been accurately measured, it is safe to say that it is at least 100 times greater as regards ornithine when compared to carbamylglutamate. Also the enzymes catalyzing Step 2 are present in mammalian tissues in concentrations at least 50 times those involved in Step 1.¹²

Besides acting as catalysts in the urea cycle, carbamylglutamic acid or the corresponding N-acyl (formyl, acetyl, etc.) glutamic acid derivatives are necessary in mammalian systems as active coenzymes for the biosynthesis of pyrimidines (reaction 5). Thus, the use of this compound in patients with liver disease might exert a two-fold effect on ammonia metabolism. It would promote the removal of ammonia via the urea cycle, and also might stimulate liver regeneration by its capacity to act as a coenzyme for the synthesis of pyrimidines and, therefore, of nucleic acids which are fundamental building blocks of the cell. It has been shown that the oral administration of carbamylglutamate results in an increase of enzymatic activity for citrulline synthesis.¹⁶ For these reasons we are presently conducting clinical studies involving the prolonged oral administration of monopotassium carbamylglutamate to test its effectiveness in preventing the development of ammonia intoxication in susceptible individuals.

Acknowledgment

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All genuine progress results from finding new facts. No law can be passed to make an acre yield three hundred bushels. God has already established the laws. It is for us to discover them, and to learn the facts by which we can obey them.

—Wheeler McMillen

Hyperglobulinemic Purpura

Report of 14 Cases Fulfilling Waldenström's Criteria

SLOAN J. WILSON, M.D., and ROBERT E. BOLINGER, M.D., with the technical assistance of BETTY J. SLINKER, A. B., Kansas City

The concept of hyperglobulinemic purpura was introduced by Waldenström¹ in 1943. Three patients were described. A later article by the same author reported four additional cases.^{2, 3} He further stated that he believed the disease or syndrome was not uncommon, of a benign nature, and of long duration. Twenty additional cases have been reported, 13 of which have been from the University of Kansas Medical Center.^{4, 5, 6, 7, 8, 9, 10, 11, 12} Our previous report was of a preliminary nature, and it is our purpose now to present these patients in greater detail and add an additional case. We also believe that hyperglobulinemic purpura is much more common than is indicated in the literature.

Waldenström's criteria for the diagnosis of "purpura hyperglobulinemica" are as follows: The purpura is of a relapsing type, appearing chiefly on the legs, and occurs mainly after bodily exertion. There are no other signs of a hemorrhagic disease. The purpuric lesions are of short duration but are characteristic in that they leave pigmented spots on the legs. These have a typical appearance, thus making it easy to suspect the correct diagnosis.

There is an absence of any other "acceptable diagnosis." The serum globulin is increased, and there is no tendency for the protein increase to return to normal. The increase in protein is in the gamma globulin fraction. The erythrocyte sedimentation rate is accelerated. The usual coagulation studies are normal, including those of blood platelets. The course of the disease is benign, and the outcome has never been fatal.

All of our cases conformed to Waldenström's criteria, with the exception of two instances in which the platelet level was moderately decreased but not to hemorrhagic levels.

Methods

The electrophoresis of blood serum was done by the filter paper technique, using a modification of the method of Durrum,¹³ Kunkel and Tiselius,¹⁴ and Kunkel and Slater.¹⁵ The addition of glycerol (5 per cent) was found to produce a more distinct pattern. Platelets were determined by the direct ci-

trate method of Rees and Ecker¹⁶ (normal 225,000 to 325,000 per cu. mm.). Prothrombin values were obtained by Quick's method.¹⁷ Intravenous coagulation time was determined by the three-tube modification of the Lee and White method (normal 12 to 24 minutes).

Clinical Evaluation

The symptoms were consistent with those described initially by Waldenström. All but three patients were females. The principal reason for seek-

Fourteen cases of purpura with hyperglobulinemia are presented (purpura hyperglobulinemica of Waldenström).

The etiology is unknown. The disease or syndrome is of a benign nature. The purpura is of a recurrent type, confined for the most part to the lower extremities and associated with brown pigmentation of the skin.

Coagulation studies are normal. There is an abnormality in the serum proteins, with marked increase in the gamma globulin fraction.

Major surgical procedures were performed in two cases with no hemorrhagic tendency or increased loss of blood. Recovery was uneventful.

Various therapeutic regimens have had no effect. There was no benefit from corticotropin (ACTH) and corticosteroids.

ing medical assistance was the disfiguring pigmentation of the legs, as this was noticeable when sheer hosiery was worn.

Several patients noticed painful sharp needle-like sensations in their legs when fresh crops of purpura appeared. An excellent example was reported by a waitress who had no symptoms during the day, but if she went out dancing in the evening the purpura would be severe. Another patient, a

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TABLE 1
CLINICAL AND COAGULATION DATA, 14 CASES OF HYPERGLOBULINEMIC PURPURA
Gamma Globulin Was Increased in Each Case

| Pt. | Age | Sex | Race | Duration of Disease | Gamma Globulin % | Total Protein gms. % | Platelets | Coagulation Time W | Bl. time | Cl. retraction | Per Cent Prothrombin |
|-----|-----|-----|------|---------------------|------------------|----------------------|-------------------|--------------------|----------|----------------|----------------------|
| 1. | 41 | F | W | 5 yrs. | 45 | 7.65 | 246,000 | 15'30" | 1 min. | 1½ hr. | 87 |
| 2. | 48 | F | C | 3 yrs. | 26 | 7.8 | 246,000 | 20'30" | 1'3" | .... | .... |
| 3. | 70 | M | W | 12 yrs. | 22 | 5.6 | 264,000 | 12 min. | 4 min. | 4 hrs. | .... |
| 4. | 23 | F | W | 2 yrs. | 24 | 10.8 | 208,000 | .... | 3'10" | 2½ hrs. | .... |
| 5. | 57 | F | W | 6 yrs. | 48 | 10.2 | 255,000 | 18 min. | 1 min. | 2 hrs. | 91 |
| 6. | 27 | F | W | 5 yrs. | 37 | 8.0 | 272,000 | 27min. | 5'30" | 1 hr. | 71 |
| 7. | 49 | F | W | 15 yrs. | 38 | 9.0 | 165,000 | 19 min. | 55" | 2 hrs. | 100 |
| 8. | 35 | M | W | 2 yrs. | 26 | 7.8 | 202,000 | 12 min. | 2'15" | .... | 100 |
| 9. | 42 | F | W | 7 mo. | 45 | 8.25 | 170,000 | 15 min. | 1'15" | 1 hr. | 82 |
| 10. | 52 | M | W | 16 yrs. | 22 | 7.8 | 165,000 | 9'30" | 3 min. | .... | 90 |
| 11. | 34 | F | W | 13 mo. | 24 | 6.0 | 211,000 | .... | 2'5" | .... | .... |
| 12. | 24 | F | W | 3 yrs. | 28 | 7.5 | 402,000 | 16'30" | 2'45" | 1 hr. | 100 |
| 13. | 37 | F | W | 6 yrs. | 32 | 8.1 | 85,000 114,000 | 17'30" | 45" | 3 hrs. | 87 |
| 14. | 33 | F | W | 5 yrs. | 27 | 8.2 | 92,000 120,000 | 12 min. | 3 min. | 18 hrs. | 76 |

nurse, developed purpura in the right arm in addition to purpura of the lower extremities. Further questioning revealed that she was a student health nurse, and the purpura was noticed particularly after she had shaken down thermometers when outpatients were numerous.

The duration of the purpura ranged from 7 months to 16 years (Table 1). There were three male patients and one Negro female in the group of 14. The age incidence was from 23 to 70 years. The earliest age at which purpura appeared was 21 years.

Examination revealed the typical purpuric and pigmented areas limited principally to the legs, with occasional similar lesions on the thighs. The recurring purpura resulted in a deposition of iron pigment in the skin. The presence of fresh purpura in the pigmented areas was striking. Enlarged hemorrhagic capillaries could be visualized by the use of clearing oil and a hand lens. Two patients had slight hepatomegaly. Liver biopsy was done in one case and a normal report was obtained. No other evidence of disease was found except in one patient, who had rheumatic heart disease with mitral stenosis.

Apparently the disease syndrome was benign in all patients.

Laboratory Observations

Coagulation studies (Table 1) included platelets, intravenous coagulation time, bleeding time, clot retraction, and prothrombin values. Platelet levels were excellent in all but two patients, and in these the platelet values were not in the hemorrhagic zone. All other tests were normal.

Particular attention was given to a study of the serum proteins. The gamma globulin peak was distinctly abnormal, being markedly elevated. Actual quantitative evaluation of the various protein components revealed that the gamma globulin ranged from 21 to 48 per cent of the total serum protein. (Normal average gamma globulin 12 per cent of the total serum protein.) The total protein is given in Table 1.

Evaluation of Possible Hemorrhagic Tendency

Coagulation studies reveal no defect in the coagulation mechanism. Not all known factors were evaluated. Two patients had been advised to have surgical procedures.

Patient No. 3, male, age 70 years, had benign prostatism with obstruction. Purpuric lesions had been severe for 12 years. A transurethral prostatic resection was accomplished with no excessive blood loss. The entire postoperative course was uneventful.

Patient No. 1, female, age 41 years, had rheumatic heart disease with mitral stenosis. Purpuric lesions had been noticed for five years. The Cardiovascular Service recommended that a commissurotomy be done. On the basis of our experience with the previous patient, we stated that excessive blood loss would probably not be a problem. Fortunately our prediction was true. A mitral commissurotomy was done without hemorrhage or postoperative bleeding. The recovery period was uneventful.

Evaluation of Therapy

Various therapeutic regimens have met with complete failure. Vitamins C and P had no effect. Antihistamines of various types were not beneficial.

None of the patients responded to intensive therapy with either corticotropin (ACTH) or corticosteroids. Figure 2 illustrates a patient treated with ACTH. The total amount of protein decreased, but the characteristic electrophoretic pattern of the serum

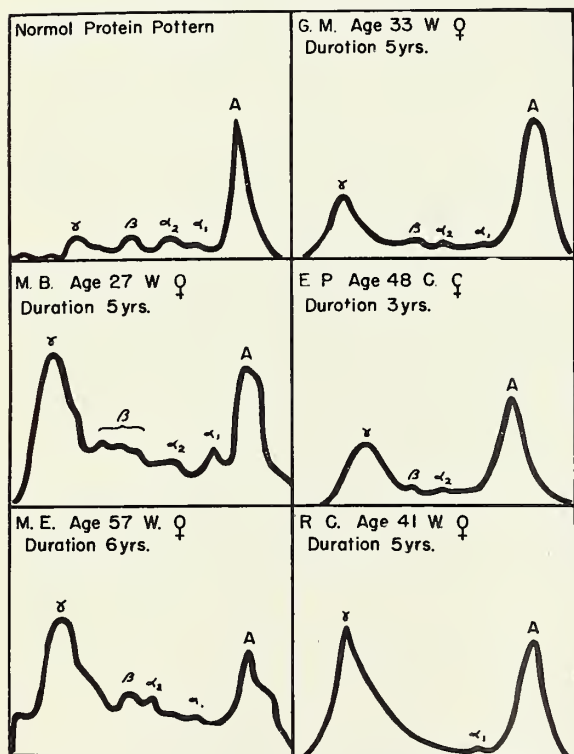


Figure 1. Serum protein electrophoretic pattern in purpura hyperglobulinemia (Waldenström). The upper left electrophoretic pattern is normal and can be used for comparison. The remaining five show an elevation in the gamma globulin peak.

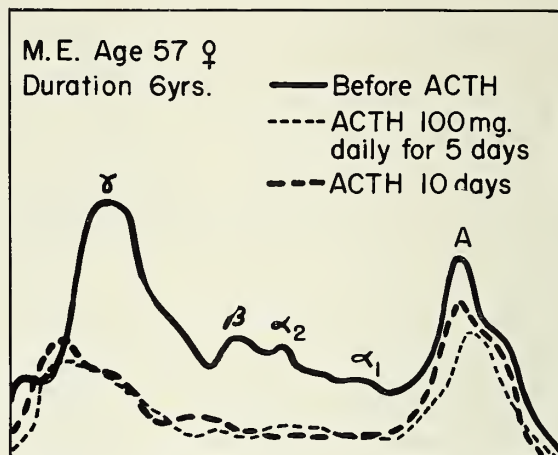


Figure 2. Effect of ACTH in a case of purpura hyperglobulinemia. Although the gamma globulin peak is decreased, the characteristic defect in the electrophoretic pattern remains.

proteins persisted. There was no clinical improvement.

Discussion

The 14 patients presented had essentially all of the characteristic features of hyperglobulinemic purpura as described by Waldenström.³ To establish a diagnosis of this disease or syndrome it is necessary to eliminate systemic diseases that may be associated with elevated gamma globulin and purpura.

An elevated gamma globulin may be present in many diseases. Arends, Coonrad, and Rundles^{18, 19} observed hypergammaglobulinemia in 6 of 10 patients with Hodgkin's disease and in 5 of 15 patients with malignant lymphomas and mycosis fungoides. In various types of leukemia an increase in globulin constituents frequently occurs. An increased gamma globulin may occur in lymphogranuloma inguinale, chronic liver disease, the collagenoses, sarcoidosis, and multiple myeloma.

Hemorrhagic tendencies associated with cryoglobulinemia or macroglobulinemia must be excluded. The clinical picture is entirely different. Cold worsens cryoglobulinemic purpura and is frequently associated with Raynaud's phenomenon. Purpura associated with large globulin molecules (macroglobulinemic purpura) usually occurs in elderly men with osteoporosis and generalized bleeding. Multiple myeloma may be present. The gamma globulin is not increased in idiopathic thrombocytopenic purpura.

The etiology of hyperglobulinemic purpura is unknown. No drugs or toxic agents have been incriminated in our cases or those reported in the literature. In our experience hyperglobulinemic purpura is not an unusually rare disease or syndrome. Waldenström also states that it is much more common than the lit-

erature indicates. The statement of Seiden and Wurzel¹² is quoted herewith: "In conclusion, if there is such a syndrome as benign hyperglobulinemic purpura—that is, if the patients with known cases continue to enjoy good health despite purpura—the case presented—seems to fit the description—" The only contribution we can possibly make to this classic remark is to change "case presented" to "cases presented."

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Hyperthyroidism and Myasthenia Gravis

Case Report of Coincident Conditions

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In 1908 Rennie¹ reported the first case of hyperthyroidism and myasthenia gravis occurring together. Buzzard²⁵ in *Allbutt's System of Medicine* in 1910, writing about myasthenia gravis, stated that it frequently is associated with hyperthyroidism. Since that time there have been a number of reports of the two diseases occurring in the same patient. A review of the English literature reveals 85 fairly well documented cases have been reported.¹⁻²⁴ Some of the reported cases are not included in this number, some being omitted because it was felt that the diagnosis was questionable.

Eaton²⁶ stated that 6 per cent of patients with myasthenia gravis at the Mayo Clinic either have or have had hyperthyroidism. At the Lahey Clinic 4.4 per cent of 90 patients with myasthenia gravis had hyperthyroidism,¹⁶ and at the Johns Hopkins Hospital 5 per cent of 220 patients with myasthenia gravis

had an "abnormality of the thyroid gland."²² Kane²⁷ stated that approximately 24 reported cases of coincident hyperthyroidism and myasthenia gravis have been well documented.

It is felt that presentation of this case is justified because of the relatively few case reports of coincident hyperthyroidism and myasthenia gravis, and because this demonstrates the problem of differential diagnosis of muscle weakness accompanying hyperthyroidism.

A review of the English literature reveals that 85 fairly well documented cases of coincident hyperthyroidism and myasthenia gravis have been reported. An additional case is reported, the classification of muscle disorders occurring with thyroid disease is reviewed, and these syndromes are discussed.

From the Department of Internal Medicine, University of Kansas Medical Center. Dr. Shafer is a resident in internal medicine and Dr. Allen is associate professor of medicine.

Case Report

This 28-year-old white housewife was admitted to Kansas University Medical Center for the first time on October 29, 1955, with a chief complaint of goiter. She had been well until about three years before admission, when she began to have irregular menstrual periods, menorrhagia, and increasing nervousness. She was given iodine drops for a few months with subsequent improvement. Increasing enlargement of the thyroid with minimal dysphagia had first been observed two and one-half years before admission. Exophthalmos and diplopia of increasing severity began two years before admission. An increasing degree of nervousness and tremor had been present for one year, and at this time ptosis of the eyelids, which was more severe in the late part of the day, began.

In spite of a good appetite and adequate intake of food, the patient had lost weight from 140 pounds to 119 pounds in the year prior to admission. Weakness of the quadriceps muscles followed by generalized weakness had been present for four months, and for three weeks prior to admission she had been so short of breath and had such marked muscular weakness that she was unable to walk across the room. History of diarrhea, constipation, or abdominal pain was denied. Marked heat intolerance had been noted for an unknown period of time. She had been taking propylthiouracil for five months without improvement, and it had been discontinued one week before admission.

At the time of admission the patient appeared to be thin, apprehensive, and seriously ill. The blood pressure was 155/95 mm. Hg., pulse rate 152 per minute and regular, temperature 99.6 degrees Fahrenheit, respiratory rate 24 per minute, and weight 119 pounds. The skin was warm and moist, and there was a fine tremor of the hands. Obvious exophthalmos with a staring gaze and almost complete paresis of the extraocular muscles were present. The thyroid was diffusely enlarged, and a bruit was present over the gland. Depth of respiration was shallow, and the lungs were clear. The heart was enlarged to two centimeters to the left of the midclavicular line, and there were no cardiac murmurs or thrills. No organs or masses were palpable in the abdomen, and there was no tenderness. Actual muscular atrophy was not present, but marked generalized muscular weakness was apparent. Deep tendon reflexes were absent in the right extremities and sluggish in the left extremities.

Several urinalyses and complete blood counts were normal. Determinations of the blood urea nitrogen, fasting blood sugar, and serum electrolytes were within normal limits. Repeat determinations of 24-hour urinary excretion of electrolytes revealed that potassium excretion ranged from 52 to 192 milli-equiva-

lents per 24 hours. X-ray of the chest was normal at the time of admission. Electrocardiograms were normal except for sinus tachycardia. Twenty-four-hour uptake of I^{131} was 56 per cent on October 29, 1955 and 61 per cent on December 8, 1955. Fluoroscopy of the chest and planograms of the superior anterior chest did not reveal enlargement of the thymus.

A diagnosis of thyrotoxic crisis was made on the basis of the history of goiter, weight loss, and heat intolerance; the physical findings of an extremely nervous and seriously ill woman, exophthalmos, goiter with a bruit, marked tachycardia, warm moist skin, and tremor; and an I^{131} uptake of 56 per cent in 24 hours. Accordingly the patient was given Lugol's solution four drops three times a day, sodium phenobarbital 120 milligrams intramuscularly every four hours, potassium chloride 4.0 grams a day, methimazole 10 milligrams every eight hours, and cortisone 100 milligrams orally every six hours.

When this patient was first seen it was felt that the muscular weakness was due to thyrotoxic myopathy; however, as the symptoms of thyrotoxicosis began to subside, as manifested by a decrease in the degree of nervousness and slowing of the heart rate, further observations made us question whether or not the patient might have some other disease in addition to hyperthyroidism.

Such weakness was present that she was unable to hold her arms above her body while in a supine position. Her vital capacity was decreased, and it was recorded as low as 800 mL. on several occasions. She stated that the muscular weakness was always worse in the late part of the day. During the second hospital week it was noticed that, after the patient talked for a short while, her voice became weak.

The possibility of the coexistence of myasthenia gravis and hyperthyroidism was considered. Because of this hypothesis, on November 18, 1955, the patient was given 0.25 milligrams of neostigmine methylsulfate intramuscularly, and it was observed that her muscular strength increased and her vital capacity increased from 800 to 1400 mL. On succeeding days 0.25 to 0.50 milligrams of neostigmine methylsulfate was given intramuscularly several times, following which there was increase in her muscular strength. On November 22, 1955, the administration of 15 milligrams of neostigmine bromide orally every eight hours was started. The dosage of neostigmine was progressively increased until she was receiving 15 milligrams every three hours from 6:00 a.m. to midnight. With this medication, remarkable increase of muscular power was observed. The degree of ptosis of the eyelids and weakness of the extraocular muscles was improved only slightly. Electromyographic studies performed before and after the administration of neostigmine gave results that were not typical of myasthenia gravis.

After the initial week in the hospital the dosage of cortisone and phenobarbital was decreased and, later, the administration of these drugs was discontinued. In the latter part of November, 1955, the administration of Lugol's solution and methimazole was discontinued. On December 8, 1955, the I^{131} uptake was 61 per cent in 24 hours, and the patient was given a therapeutic dose of eight millicuries of I^{131} .

After administration of the therapeutic dose of I^{131} , the patient's condition improved slowly, and intolerance to heat and muscular tremor decreased. By December 28, 1955, her weight had increased to 126 pounds, and her pulse rate was 100 per minute. Muscular power was improved as long as she was receiving neostigmine. She was discharged from the hospital December 31, 1955, with the only medication being neostigmine bromide 15 milligrams orally every three hours, 6:00 a.m. to midnight.

The patient was next seen February 3, 1956, at which time she was feeling much improved. She was spending much of the day up in a chair and was able to walk from the bedroom to the bathroom without assistance. At that time she weighed 127 pounds, her pulse rate was 94 per minute, and her hands were moderately warm. It was felt that she was still moderately hyperthyroid.

On April 2, 1956, it was observed that the patient's muscular power was much improved. She was up and around the house, doing the housework and the cooking. She was still taking neostigmine seven times a day. An I^{131} uptake was 46 per cent in 24 hours. Because it was felt that she was still hyperthyroid, 6.0 millicuries of I^{131} was given as a treatment dose.

By July 30, 1956, the patient was doing well. She was doing her own housework and, in addition to this, was able to walk across the street to a neighbor's house. The dosage of neostigmine had been decreased to 15 milligrams orally every four hours, 5:00 a.m. to 9:00 p.m. Examination revealed that the thyroid was no longer enlarged, the palms were neither warm nor moist, and there was no tremor. She had excellent muscular power, was able to hold her arms in any position, and was able to step up on a chair. There was no decrease in muscular power of her hands after repetitively gripping them 20 times. She was able to move her eyes 20 degrees laterally from a forward gaze. The I^{131} uptake was 17 per cent in 24 hours. It was felt that the patient was in a euthyroid state and that her myasthenia gravis was improved.

The patient was last seen November 13, 1956, at which time her condition was improved. She had reduced the dosage of neostigmine to 15 milligrams three times a day. She was able to perform all activities except that she did have some difficulty walking up and down stairs. She stated that she was improving as each month went by and that all muscular power

was increased except that the degree of ptosis of the eyelids was slightly increased. Muscle power was normal except for a moderate degree of ptosis of the eyelids and limitation of lateral gaze to about 45 degrees. I^{131} uptake was 30 per cent in 24 hours, and the protein bound iodine was 5.8 gamma per cent.

Discussion

The syndrome of hyperthyroidism is familiar to all physicians. Likewise, it is well known that some weakness of the quadriceps femoris and ileopsoas muscles often accompanies hyperthyroidism. However, the fact that severe muscle disorders may accompany hyperthyroidism is not so well appreciated.

Several classifications of muscle disorders occurring with thyroid disease have been advanced. The classification most commonly quoted is that proposed by Starling, Drake, Hunt, and Brain²⁸ in 1938. A more useful classification is that given by Millikan and Haines.²¹

1. Thyrotoxicosis and
 - A. Myasthenia gravis
 - B. Chronic thyrotoxic myopathy
 - C. Periodic paralysis
 - D. Exophthalmic ophthalmoplegia
2. Hypothyroidism and altered muscle function

Exophthalmic ophthalmoplegia. Brain²⁹ wrote the classic article on this subject and popularized the term, but it has been discussed in other excellent articles.^{14, 21} The syndrome consists of exophthalmos and ophthalmoplegia and implies only that these abnormalities may occur together.

It is a disorder localized in the soft tissues and muscles of the orbits. It may be due to an increase in the fat content of the retrobulbar tissues. Pathological examination of the extraocular muscles reveals that they are enlarged, edematous, and infiltrated with lymphocytes, connective tissue, and fat. This syndrome may be associated with any degree of hyperthyroidism and has been reported in patients in whom hyperthyroidism has not been recognized.

In this syndrome the weakness is limited to the extraocular muscles, and the levator oculi palpebrae are often spared. In minimal cases, the weakness may be limited to upward gaze. There is no characteristic fatigability of muscles as there is in myasthenia gravis, and the weakness is not improved by the administration of neostigmine. Usually there is chemosis, photophobia, and edema of the eyelids. The condition is most often bilateral but may be unilateral. Generally the ophthalmoplegia parallels the degree of exophthalmos, but there are exceptions.

Hyperthyroidism and periodic paralysis. The association of these two diseases is not common, but according to Millikan and Haines²¹ is more common than would be expected by chance. They found that

in 400 cases of familial periodic paralysis reported in the literature, in somewhat less than 30 there was concurrent hyperthyroidism.

Familial periodic paralysis is characterized by periodic attacks of flaccid paralysis of muscles of all extremities. It has been noted that attacks are associated with low levels of serum potassium. Milhorat³⁰ stated that attacks can be terminated by the oral administration of potassium chloride, but other authors say that there is no immediate improvement by the intravenous infusion of potassium. With adequate treatment of the hyperthyroidism, attacks of periodic paralysis either disappear or become infrequent.

There should be no difficulty in differentiating this syndrome from the other muscle disorders that occur with hyperthyroidism. Patients with periodic paralysis are completely asymptomatic between attacks, and their muscles appear normal.

Chronic thyrotoxic myopathy. Some degree of muscle weakness, especially of the muscles of the legs, has been known for years to be part of the classic picture of hyperthyroidism. However, the full-blown picture of thyrotoxic myopathy is not widely known. This syndrome is characterized by muscle weakness and wasting. The etiology is not understood as with the previously described syndromes. It occurs in an older age group than does uncomplicated hyperthyroidism. The degree of muscle weakness and wasting is often greatly out of proportion to the degree of hyperthyroidism.

Muscles of the shoulder and hip girdles are most commonly affected, with those of the latter being the more severely involved. Smaller muscles are not usually affected, or at least not to the same degree, and muscle involvement is usually symmetrical. Muscles innervated by cranial nerves are not involved. Fasciculations have been reported by McEachern and Ross,³¹ but in other cases they have not been seen.^{14, 21} Tendon reflexes may be normal or symmetrically hyperactive. It is of interest, in the series of Millikan and Haines,²¹ that 77 per cent of nine patients with chronic thyrotoxic myopathy were males and 80 per cent of 25 patients with hyperthyroidism and myasthenia gravis were females. Chronic thyrotoxic myopathy may present a picture similar to that of amyotrophic lateral sclerosis.

McEachern and Ross³¹ reported that in their patients with chronic thyrotoxic myopathy there was some improvement of muscle power after the administration of neostigmine. However, most authorities agree that this does not occur in this group of patients. Muscle weakness and atrophy in chronic thyrotoxic myopathy are cured by adequate treatment of the hyperthyroidism.

Hyperthyroidism and myasthenia gravis. Myasthenia gravis is a chronic disease characterized by an

increasing degree of weakness after the use of various voluntary muscles. Hyperthyroidism occurs more commonly in patients with myasthenia gravis than would be expected by chance.

Myasthenia gravis is due to a defect in neuromuscular transmission at the motor endplate, but the exact defect is not known. There is a close resemblance electromyographically between the neuromuscular block in myasthenia gravis and the block produced with d-tubocurarine in normal subjects.³² Adams, Denny-Brown, and Pearson³³ stated that it is commonly assumed that defective production of acetylcholine at the motor end plate is the primary defect in myasthenia gravis. They concluded, however, that acetylcholine is only of relative importance in the pathogenesis of this disease and that the exact etiology is not understood.

In myasthenia gravis, characteristically, muscles innervated by cranial nerves are involved as well as muscles of the extremities. Patients often have ptosis of the eyelids and note an increasing degree of weakness as they talk, chew, or swallow.

There are no specific tests diagnostic of myasthenia gravis. The electromyograph may or may not be of value. Most important in making this diagnosis is some form of test using neostigmine, edrophonium, or curare.^{35, 39} The neostigmine test may be performed in many ways. Tether proposed that 0.5 milligrams of neostigmine be given intravenously over a one-minute period. He stated that in myasthenia gravis there is improvement of muscle power before the needle is withdrawn. If side effects occur, atropine 0.6 milligrams is given subcutaneously.

Edrophonium is a drug similar in action to neostigmine but with a shorter duration. Because of this it is probably superior for testing for this disease. Ten milligrams of edrophonium chloride is injected intravenously, and, according to Osserman and Teng,³⁷ in patients with myasthenia gravis improvement in muscle power occurs within 30 to 40 seconds.

According to Millikan and Haines,²¹ in some cases of myasthenia gravis there may be no improvement in muscle power after neostigmine administration, and in these cases the diagnosis may be established only by using some form of curare testing. One-tenth of the dose of curare that would produce mild curarization in a normal adult will produce aggravation of muscle weakness in a patient with myasthenia gravis. Much caution should be used in performing a curare test, however, as it is potentially a dangerous procedure. Individuals performing this test should be prepared to give artificial respiration and to give neostigmine or edrophonium intravenously if necessary.

Most authorities agree that improvement of muscle power after neostigmine administration does not occur in muscle disorders other than myasthenia gravis.

Millikan and Haines²¹ stated that an increase or decrease in muscle power after neostigmine or curare administration respectively is diagnostic of this disease.

The reason for the association of these two diseases is not known. Kane³⁴ cited some interesting observations concerning the thyroid gland. He referred to work which revealed a significant increase in serum cholinesterase levels in 50 per cent of 35 patients with thyrotoxicosis, and to the common finding of focal collections of lymphocytes in voluntary muscles of patients with hyperthyroidism as well as those with myasthenia gravis.

Some observers have reported a "see-saw" relationship between these two diseases,^{6, 15, 23} and they have noted that as the hyperthyroidism improved the myasthenia gravis became worse. Others have reported the opposite.²¹ It is the opinion of these authors that the hyperthyroidism should, and as a matter of fact often must, be treated.

Hypothyroidism and altered muscle function. Part of the classical picture of hypothyroidism is the generalized slowing of muscle function. Means⁴⁰ stated that in patients with hypothyroidism muscles become weak and flabby and myalgias are often present. The decreased speed of contraction and relaxation of the gastrocnemius muscle in testing the Achilles reflex is characteristic of hypothyroidism.

Comments

The authors feel that the diagnosis of both hyperthyroidism and myasthenia gravis is well established in this case. The patient presented the classic history and physical findings of hyperthyroidism. The diagnosis of myasthenia gravis was established on the basis of the following findings. There was weakness of muscles innervated by cranial nerves, including extraocular muscles and those muscles concerned with speech, as well as weakness of the muscles of the shoulder and hip girdles and upper and lower extremities. There was weakness of the muscles concerned with ventilation, which does not occur in chronic thyrotoxic myopathy. There was increasing weakness of muscles with their continued use, which is pathognomonic of myasthenia gravis. Absence of typical electromyographic changes does not rule out this disease. Finally, marked improvement in muscle power after neostigmine administration is seen, according to most authorities, in no disease other than myasthenia gravis.

Several points deserve further comment. In this case, the myasthenia gravis became manifest after the first symptoms of hyperthyroidism appeared, and during thyrotoxic crisis. The so-called "see-saw" relationship between hyperthyroidism and myasthenia gravis is not seen for, as this patient became euthy-

roid, the myasthenia gravis steadily improved. Essentially all of the voluntary muscles of this patient were affected, and a striking feature was the reduced ventilatory capacity.

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Hemangioma of the Liver

Removal of Cavernous Tumor by Right Hepatectomy

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Although surgical removal of a part of the liver for tumor was successfully accomplished as early as the year 1891, the reported cases of total right hepatectomy are relatively few in number. Fineberg found only 20 cases reported in the surgical literature before March, 1955, and added a case of his own.¹ Only one of these cases had been reported prior to 1947. Four additional cases have been reported since March, 1955. The purpose of this article is to add another case of total excision of the right lobe of the liver for a cavernous hemangioma of massive proportions.

K.U.M.C. 54-6184, R. D. C., a 24-year-old white housewife, was admitted to the University of Kansas Medical Center on July 23, 1954, with the history of progressive abdominal enlargement for six years. Following a full term normal delivery of a 5 pound 13 ounce boy in 1948, her abdomen did not regress in size as expected. She had no other symptoms and successfully completed another pregnancy terminating in 1952 with the birth of a 4 pound 13 ounce girl. Although she remained asymptomatic, there had been a slow but continuous increase in the size of her abdomen. She continued her household duties, including the care of her two small children.

The patient had sought medical advice on several occasions for her progressive abdominal enlargement, and she had been informed that her liver was enlarged

with displacement of her gallbladder to the left. No specific disease had been diagnosed. Other than iron therapy for anemia during pregnancy, she had received no treatment. Review of systems was negative except for some shortness of breath on climbing stairs. The past history and family history were not significant.

The patient was alert and cooperative and not in distress. Her height was 62 inches, weight 131½ pounds, blood pressure 148/80, and pulse rate 104 and regular. The heart was of normal size, and a non-transmitted systolic murmur was detected over its base. The upper abdomen was protuberant. A huge, smooth, firm non-tender mass could be palpated in the

The successful removal of a cavernous hemangioma involving the entire right lobe of the liver is reported. A detailed account of the surgical operation and postoperative course over a significant period is given. Experimental and clinical evidence indicates a more aggressive approach to hepatic tumors is justifiable.

right upper quadrant. This was not separable from the liver. The mass extended to the left of the umbilicus and downward to the iliac crest. A one-millimeter, red, firm, non-tender nodule was present on the skin

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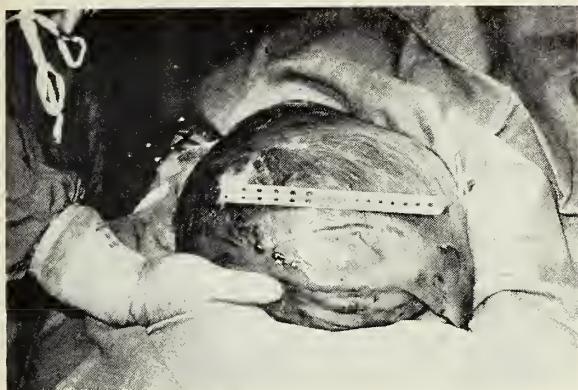


Figure 1. Photograph of the hemangioma taken at the operating table. The surgeon's hand rests under the inferior portion of the tumor, just above the right iliac crest.

over the dorsum of the right ring finger. There were no other significant findings.

Pertinent laboratory findings were as follows: red blood count 4,443,000, hemoglobin 10.0 gms., white blood count 9,700 with normal differential, urinalysis normal, sedimentation rate 25 mm. in 30 minutes, glucose tolerance (fasting and one hour intervals in sequence) 99, 89, 83, 75, 73, blood-urea-nitrogen 8.6, total protein 7.5 gms./100 cc., albumin 4.6 gms., globulin 2.9 gms., prothrombin time 75 per cent of normal, serum bilirubin direct 0.3 mgm. per cent, total 0.9 mgm. per cent. The bromsulphalein test showed all dye removed, the cholesterol was 304 mgm. per cent with esters 55 per cent of the total, alkaline phosphatase 2.1 Bodansky units, thymol turbidity 6, cephalin cholesterol 2 plus. The electrocardiogram was normal.

The chest roentgenogram was normal. Roentgenogram of the abdomen showed a homogeneous soft tissue density occupying the entire right side of the abdomen extending down to the pelvis. A cholografin study showed a gallbladder of normal size and shape displaced several centimeters to the left of the vertebral column. Intravenous pyelograms showed displacement of the right kidney to the left of the midline. An upper gastrointestinal series was normal except for displacement of the stomach and small bowel to the left.

The skin lesion on the right ring finger was excised under local anesthesia on July 27, 1954. Microscopic examination of paraffin sections showed focal acanthosis and hyperkeratosis with a few small capillaries in the upper corium.

The patient was transferred to the surgical service. Laparotomy was done on August 2, 1954, through a vertical right paramedian incision extending from the costal margin to below the umbilicus. The entire

right side of the abdomen was found to be filled with a huge mass which replaced the right lobe of the liver (Figure 1). Many dilated pulsating vessels were present over the surface of the mass, which was nodular and firm in consistency. The right lobe of the liver was replaced by tumor except for a small margin along the falciform ligament. The left lobe was about three times normal size and was normal in color and texture. The caudate lobe was also free of involvement by the mass.

The incision was extended over the anterior course of the seventh rib, which was removed subperiosteally. The thorax was opened widely. The diaphragm was opened in a line parallel to its muscle fibers from the incision through the costal margin. This completely exposed the superior surface of the right lobe of the liver. The liver was then elevated through the incision through the diaphragm and permitting exposure of the porta hepatus.

The cystic duct was divided to enhance the exposure of the common hepatic duct. The right hepatic artery was greatly enlarged; it was estimated to be 18 mm. in diameter. It was ligated at its origin from the common hepatic artery and divided. The branch of the portal vein to the right lobe of the liver was ligated and divided. The right hepatic duct was divided, after a probe had been passed through the proximal end into the left hepatic duct for precise identification. The right lobe was then rotated anteriorly and medially to expose its posterior aspects.

The liver was dissected from the inferior vena cava. Numerous branches from the right lobe of the liver to the vena cava were divided between silk ligatures. In isolating the most superior vein, the vena cava was entered, requiring application of a non-crushing clamp for control. At this point excessive hemorrhage occurred from tears in other small branches to the inferior cava produced by traction on the mass. Non-crushing clamps were placed across the vena cava above and below the area. The liver substance was quickly divided between the right and left lobes, by successively placing large clamps across the parenchyma. Intercommunicating veins were individually clamped and ligated.

After the right lobe and tumor mass were removed, the bleeding points of the inferior vena cava were then sutured with 5-0 arterial silk. The cut surface of the liver was sutured with interrupted interlocking sutures of number 1 silk. The falciform ligament was sutured over a part of the transected surface. A T-tube was then placed with the short arms in the left hepatic duct and common duct, the long arm leading through the transected stump of the right hepatic duct and through the abdominal wall. Two large rubber-covered gauze drains were placed through a separate

stab wound from the transected surface of the liver and the right subphrenic area. The wound was closed in a routine manner without chest drainage.

A period of hypotension secondary to the bleeding from the vena cava when the mass was removed had existed for approximately 25 minutes. The systolic pressure varied from 60 to 30 mm. Hg. Otherwise the blood pressure and pulse were stable throughout the operation. Six thousand cc. of citrated blood were infused during the operation.

The patient was given 750 cc. of blood and 1000 cc. of dextran in addition to the other fluids during the first 48 hours postoperatively. Oral feedings were started on the fourth postoperative day; by the tenth day a high-protein high-carbohydrate diet was tolerated. A body temperature elevation occurred daily, reaching as much as 102 degrees Fahrenheit. A right pleural effusion occurred, and on the 22nd postoperative day 700 cc. of sero-sanguineous fluid was aspirated from the right pleural space. A few colonies of coagulase negative hemolytic staph aureus bacteria were grown from the fluid when it was cultured.

The patient was dismissed from the hospital on August 29, 1954, the 27th postoperative day, afebrile and free of symptoms. On October 4, 1954, she noted tenderness and swelling in the area of the incision on the right chest wall. There was a body temperature elevation to 100 degrees Fahrenheit. She was readmitted to the hospital on October 10, 1954. There was a tender fluctuant swelling in the scar of the thoracic portion of the incision and regional axillary adenopathy. An incision was made and the abscess was drained on the ward under local anesthesia. The wound was treated with irrigations of Dakin's solution. Purulent drainage ceased within 48 hours, and

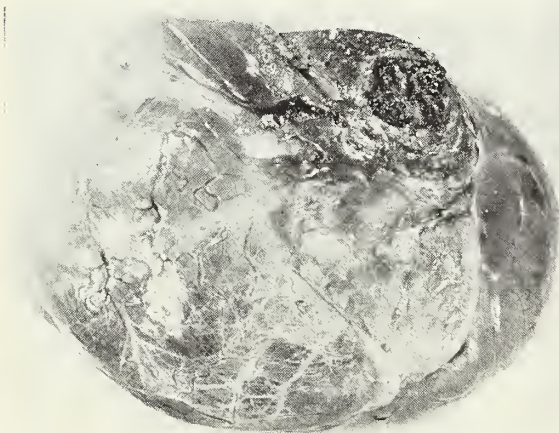


Figure 2. Photograph of the specimen following removal. A rim of normal hepatic tissue is seen along the upper portion of the tumor, through which the transection was done. The gallbladder may be seen on the upper left part of the specimen.

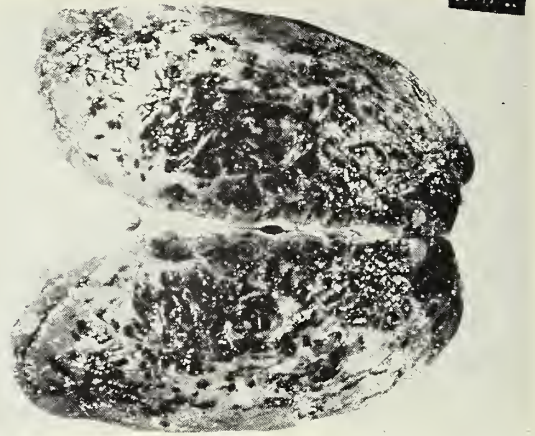


Figure 3. Photograph of the cut surface of the specimen. Note the large mottled dark areas, which represent blood-filled caverns. The intervening whitish tissue is somewhat dense and fibrotic.

the swelling and tenderness subsided rapidly. Hemolytic staphylococcus aureus, coagulase positive, was grown on culture from the abscess. She was dismissed to her home on October 16, 1954, with a small residual clean granulating wound. Her last follow-up visit to the out patient clinic was on March 21, 1956, at

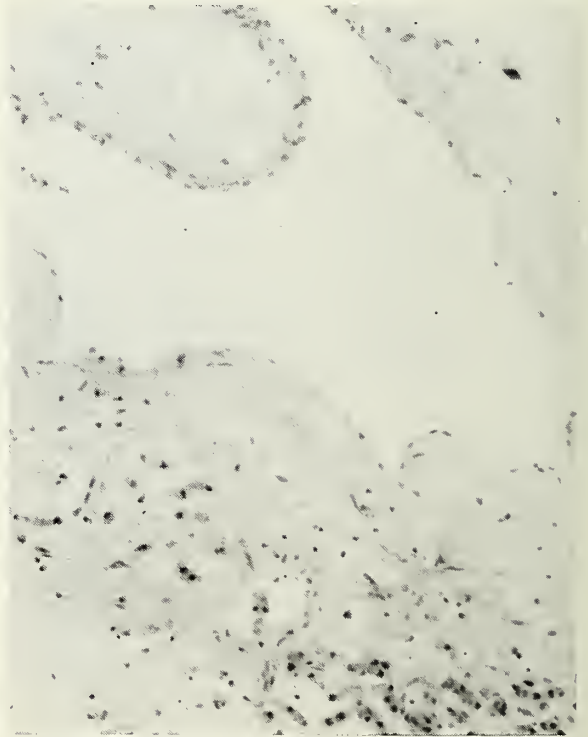


Figure 4. Photomicrograph of paraffin-fixed section from the tumor. See context for description. Note the distorted cords of liver cells in the lower portion of the field.

which time she felt well and was asymptomatic.

Liver function studies were done during the second (October, 1954) hospital admission. The bronsulphthalein retention test was negative, the cephalin cholesterol was negative, the thymol turbidity 10 units. The total protein was 7.60 gms. per cent, serum albumin 4.0 gms., serum globulin 3.6 gms. The serum bilirubin was direct 0.1 mgm. per cent, total 0.3 mgm. per cent, alkaline phosphatase 3.5, cholesterol 234. Cholesterol esters were 62 per cent. Roentgenograms of the intestinal tract following a barium swallow revealed the stomach to be shifted to the right, with the usual gas bubble resting under the right diaphragm. The stomach emptied normally.

The specimen weighed 6,500 grams and measured 29 x 24 x 10 cm. (Figure 2). It was of firm, rubbery consistency. Many large arborizing blood vessels were present over the surface of the tumor, measuring up to one cm. in width. The color was reddish-brown mottled with large blue areas. A rim of apparently normal hepatic tissue was present, measuring 8 to 9 cm. in width, extending along the entire length of the mass. A moderately distended greenish-colored gallbladder was present. On cut section, the mass was greenish-brown mottled with dark brown and reddish areas (Figure 3). A cystic space measuring 4 x 2.5 cm. was present, lined by a whitish glistening membrane and containing bright red blood. A second larger cyst was present containing a whitish gelatinous material. In another area measuring 2 x 0.8 x 1 cm., calcification was detected.

Microscopic examination of the tumor showed it to be made up of many large and small blood-containing spaces lined by a single layer of flat endothelial cells (Figure 4). Large intervening areas of fibrosis were seen with numerous brown pigment-laden macrophages. Distorted cords of liver cells exhibited degenerative changes and regeneration. Sections through the area of calcification revealed distinct bone formation (Figure 5). The pathologist's diagnosis was hemangioma of the right lobe of the liver; osseous metaplasia and focal fatty metamorphosis; miliary granuloma; and normal gallbladder.

Discussion

After reviewing the available literature we believe this to be the largest tumor of the liver to be successfully resected that has been reported. It is of interest to note that Pfannenstiel surgically removed a hemangioma of the liver weighing 5,290 grams, which was reported in 1898. Major and Black in 1918 reported a case of hemangioma of the liver weighing 18,160 grams.³ This massive tumor caused the patient's death at the age of 36 years. No surgical treatment was attempted in this case.

Cavernous hemangioma of the liver is a benign tumor which may lead to the death of the patient. Upper abdominal trauma may rupture the highly vascular lesion with resultant fatal hemorrhage. Gradual enlargement may produce pressure on adjacent organs incompatible with life. Direct involvement of the liver parenchyma may produce hepatic insufficiency. Needle or direct biopsy of the lesion may be followed

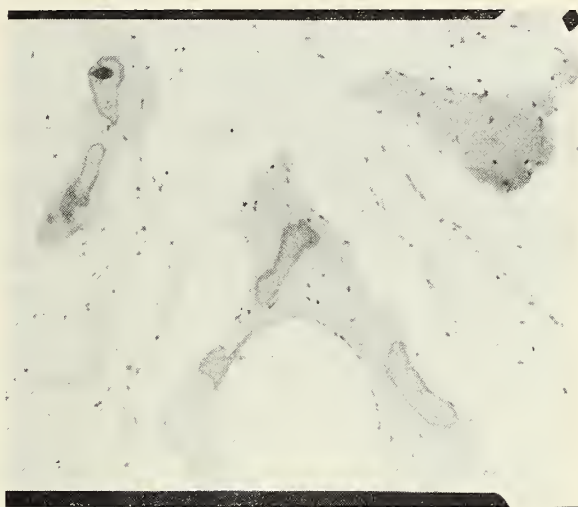


Figure 5. Photomicrograph of paraffin-fixed section from the tumor. Note the bone formation. The vascular nature of the tumor is clearly seen here, as denoted by the large spaces lined by flattened endothelial cells.

by severe hemorrhage. Complete surgical removal is the treatment most desirable, although remission of the growth has been reported following roentgen irradiation.⁴

The regenerative capacity of the liver permits massive resections to be accomplished without demonstrable interference with liver functions.² The postoperative liver function studies in this instance actually showed diminution of the serum bilirubin to a normal range, and the patient's excellent postoperative health gives no indication of liver dysfunction.

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PRESIDENT'S PAGE

DEAR DOCTOR:

Have you made plans to attend the state meeting at Wichita? If not, you should. The meeting this year will be changed from past procedures. The first House of Delegates meeting will be Tuesday morning, and the scientific session will open in the afternoon. Several excellent speakers have been secured, and I am sure you will enjoy the entire program.

The Auxiliary will likewise be invited to the opening session, and I believe they too will enjoy these speakers. The Program Committee for this year has spent many hours planning for the 1957 meeting and as usual will give you something good as well as entertaining. The next issue of the JOURNAL will carry the official program.

It is my hope that each component society will be represented. This is your meeting and you are urged to attend, not only the scientific portion but the House of Delegates meetings as well. See your delegates at work.

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

School of Medicine Issue

The JOURNAL is bursting at the seams this month, packed with more good scientific material than has ever before been crammed into one issue, and the Editorial Board takes pleasure in giving credit where credit is due—to the University of Kansas School of Medicine. This is our 11th annual University of Kansas School of Medicine issue.

Dr. Vernon E. Wilson, assistant dean in charge of student affairs at the school, serves also as an associate editor of the JOURNAL, and his responsibility under the latter title is to assemble material for the March issue each year. The size, scope, and value of this 1957 issue attest to his success on the assignment.

Our thanks to Dr. Wilson, Dean W. Clarke Wescoe, and to all the others at the school who have made it possible for us to publish an exceptionally large issue on a variety of subjects of medical interest.

Proposed Practice Act

Two bills pertaining to the licensure of those engaged in the healing arts were introduced in the Kansas House of Representatives on February 18. House Bill 281 is a Basic Science Act and House Bill 282 creates a State Board of Healing Arts. A short story of events leading to the introduction of these bills follows, along with an analysis of their content.

Two years ago the House of Delegates of the Kansas Medical Society authorized the president to appoint a committee to draft a new practice act. On the committee are members of the Kansas State Board of Medical Registration and Examination and of the Kansas Medical Society. Also serving are the attorneys for each group.

The bills proposed by this committee were presented to the House of Delegates at a special meeting on October 28, 1956. They were approved, and the committee was then authorized to negotiate with the Kansas State Osteopathic Association and with the Kansas State Chiropractic Association and to amend the bills within the approved framework. Since that time the House of Delegates of the osteopathic organization has endorsed the proposed legislation and has agreed to support it in the legislature. The chiropractors are openly opposing both bills.

The proposed Basic Science Act will require each future doctor of medicine, doctor of osteopathy and chiropractor to demonstrate his knowledge of anatomy, physiology, chemistry, bacteriology and pathology be-

fore he may practice in Kansas. The board is to consist of persons holding doctorate degrees who are engaged in the field in which they will examine and shall be on the faculty of a state supported institution of higher learning in this state.

All persons now licensed in Kansas are exempt from this requirement. The examination for future graduates shall be written and certificates from other states with standards equal to those of Kansas will be honored.

It is *not* retroactive. The Basic Science Act involves only medicine, osteopathy, and chiropractic and no other profession. All others are specifically exempted. Only the healing arts are involved. Here is the definition: "For the purposes of this act, the healing arts include any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, or injury and includes specifically but not by way of limitation the practice of medicine and surgery; the practice of osteopathy; and the practice of chiropractic."

The Healing Arts Act creates a State Board of Healing Arts, consisting of five doctors of medicine, two doctors of osteopathy and two doctors of chiropractic who will sit as one unit on matters of policy, administration and enforcement.

The examination (with one exception described later) shall be given *only* by those members on the board who hold a license of the type sought by the applicant and no one may take the examination until he has obtained a certificate from the Board of Basic Science Examiners.

License privileges for medicine and for chiropractic in this act are identical with present provisions. The new act will create two classes of osteopaths.

The osteopathic "physician" has a license from the osteopathic members of the Board and may practice according to the interpretation of osteopathy by the Supreme Court of the State of Kansas.

The osteopathic "physician and surgeon" is an osteopath who was practicing in this state on January 1, 1957, or who graduated from an approved college of osteopathy after June 1, 1950, and who has successfully passed an examination in medicine and surgery given by the doctors of medicine on the Board. No other osteopathic physician is eligible to take this examination.

The medical profession agrees under terms of this act to conduct circuit course lectures for Kansas osteopathic physicians in those subjects upon which the examination will be given.

In other words, present physicians in each of the three branches of the Healing Arts are "grand-

fathered" in with exactly their present privileges and a way is provided for osteopaths who are now in Kansas, plus recent graduates, to increase their practice privileges.

Much more should be told about this long bill, but the above remarks contain the essentials. The purpose is best described by the bill itself as follows: "Section 1. Recognizing that the practice of the healing arts is a PRIVILEGE granted by legislative authority and is not a NATURAL RIGHT of individuals, it is deemed necessary as a matter of policy in the interests of public health, safety and welfare to provide laws and provisions covering the granting of that privilege and its subsequent use, control and regulation to the end that the public shall be properly protected against unprofessional, improper, unauthorized and unqualified practice of the healing arts and from unprofessional conduct by persons licensed to practice under this Act."

98th Annual Meeting

As enthusiasm mounts for the 98th annual meeting of the Kansas Medical Society, to be held at Wichita from Sunday, May 5, through Thursday, May 9, committees planning the event are completing final arrangements. The detailed program will not be announced until next month, but an outline of the schedule is now available.

PROGRAM. The formal program at the Wichita Forum will begin Tuesday afternoon. Two out-of-state speakers will be heard, after which two Kansas physicians will present papers having to do with the general subject of geriatrics. A scientific movie will start the program on Wednesday, and three guest speakers will give papers. After a round table luncheon at the Broadview Hotel, two panel discussions will be presented, one on cardiovascular diseases and the other on gastrointestinal diseases. The Thursday morning program will include a movie on a legal subject and three scientific papers.

BUSINESS. A change in format for this year's session provides that the first meeting of the House of Delegates will be held on Tuesday morning, beginning with a breakfast at 7:30 and closing by noon. The second meeting of the House will be held on Thursday afternoon, as in the past. Both will be at the Allis Hotel.

SPECIAL EVENTS. An innovation this year, the presentation of a television program from Chicago, over a closed circuit, will be a feature of the Monday afternoon program. A panel of psychiatrists in Chicago will interview a series of patients and discuss their findings with the audience over a two-way hook-up. A meeting of the Kansas Chapter of the American Academy of General Practice will

be held Sunday afternoon and evening and Monday morning. Meetings of specialty societies will be scheduled to begin at 4:30 Tuesday afternoon, immediately after the close of the general session. Sports events are being planned for Monday with a sportsmen's banquet that evening.

BANQUET. The annual banquet of the Society will be held on Wednesday evening. During the program Dr. Clyde W. Miller will administer the oath of office to Dr. Barrett A. Nelson, president for 1957-1958. A dance will conclude the evening's events.

HOTEL RESERVATIONS. All hotel reservations are to be made individually. The largest hotels in Wichita are the Allis, the Broadview, and the Lassen.

Meeting of Pathologists

A joint meeting of members of the Kansas and Missouri Societies of Pathologists and of the College of American Pathologists in the southcentral region will be held at the Broadview Hotel, Wichita, on Saturday, March 30. A seminar on soft tissue and other tumors will be conducted by Dr. Richard Shuman, beginning at 9:00 o'clock. The moderator will be Capt. W. M. Silliphant, MC, U.S.N. After the banquet, Captain Silliphant will speak on aviation pathology.

Film on Crash Injuries

A 15-minute motion picture on the part being played by the medical profession in the prevention of auto crash injuries has been released jointly by the American Medical Association and the Ford Motor Company. Entitled "On Impact," the film is based on information about auto injuries presented at the A.M.A.'s annual meeting last June.

Prints of the film are being sent to all television stations in the United States for possible use on public service time. In addition, the feature can be booked from the A.M.A.'s film library by medical societies and their auxiliaries for showings at meetings or to the general public.

More than 396,000 health education pamphlets were sold by the American Medical Association's Bureau of Health Education during the 12 months ending June 30, 1956. The largest group sold, 69,000, concerned health of the school age child. Mental health pamphlets numbered 35,574, accidents and first aid 25,575, teeth 18,764, nutrition and diet 18,000, maternal health 17,296, physical fitness 15,319, and heart and circulation 12,400. Many of the pamphlets are reprinted from *Today's Health*.

Clinicopathological Conference

Intractable Heart Failure and Ammonia Intoxication

A 72-year-old white man complaining of shortness of breath and swelling of the ankles was admitted to the University of Kansas Medical Center for the second time on May 6, 1956.

He had been in fairly good health until September, 1955, when he began noticing weakness and fatigue. In December he had increasing dyspnea, orthopnea, and edema of the feet. His physician treated him with digitalis and diuretics, but he showed no improvement, and he was admitted to this hospital on March 7, 1956. At that time he had four plus pitting edema, rales in the bases of both lungs, Cheyne-Stokes respiration, and an enlarged heart with multiple murmurs. Treatment consisted of rest in bed, a low salt diet, digitoxin, aminophylline, and ammonium chloride. After two weeks he showed some improvement and had lost 23 pounds.

He was dismissed from the hospital on March 22 with instructions to continue to take digitoxin and aminophylline, but his symptoms again gradually increased, and he was readmitted on May 6 with severe orthopnea, edema, precordial pain, nausea, and vomiting.

He had had gonorrhea at the age of 21 years. In 1951 he was treated in our outpatient department for lues. His father and one brother had diabetes.

He was, at admission, a well-developed, well-nourished, chronically ill-appearing white man with Cheyne-Stokes respiration. His blood pressure was 135/50; pulse, 76; respiratory rate, 24. His pupils reacted to light and accommodation; there was arteriovenous nicking in the fundi. The upper respiratory examination was negative.

The neck veins were engorged, and moist rales were in the bases of both lungs. The apical cardiac impulse was in the sixth intercostal space at the mid-axillary line. The second aortic and second pulmonic sounds were poorly heard. There was a grade II diastolic thrill at the apex and a grade II systolic thrill in the second intercostal space at the right sternal border. A grade III systolic murmur was heard at the apex with a grade II presystolic crescendo murmur. A grade IV, harsh, systolic murmur

was heard at the aortic area, and a grade III, aortic, diastolic murmur was transmitted to the apex.

The liver was firm and tender, and the edge was 8 cm. below the right costal margin. The tip of the spleen was palpable. There was three plus pitting edema of the lower extremities. Rhomberg's sign was positive, and the deep tendon reflexes of the lower extremities were absent. Babinski and Hoffman signs were absent.

The specific gravity of the admission urine specimen was 1.015; there was 2 plus albumin and 10 pus cells per high power field with pus clumps. The red count was 4,500,000 with 14 gm. hemoglobin, and the hematocrit was 42. The admission white count was 7,300 with 84 per cent polymorphonuclears. A subsequent white count on May 10 was 12,100 with 90 per cent filamented polymorphonuclears, 8 per cent lymphocytes and 2 per cent monocytes. On May 14, one day before death, the white count was 15,500 with 91 per cent polymorphonuclears, 8 per cent lymphocytes, and 1 per cent monocyte.

The serologic tests for syphilis were reactive with 32 Kolmer units and 4 Kahn units. The fasting blood sugar was 28 mg. per cent; sodium, 132 mEq/L; potassium, 6.1 mEq; chloride, 103 mEq; and carbon dioxide, 16.8 mEq. The blood ammonia was 163 gamma per cent; direct bilirubin, 2.6 mg. per cent; total bilirubin, 5.2 mg. per cent; thymol turbidity, 27 units; alkaline phosphatase, 3.5 millimol units; non-protein nitrogen, 99 mg. per cent. The blood urea nitrogen was 58 mg. per cent; creatinine, 2.5 mg. per cent. Subsequent blood sugar values ranged from 73 to 167 mg. per cent; subsequent blood ammonia from 145 to 225 gamma per cent.

On admission the patient appeared lethargic and slightly jaundiced. He was treated with intravenous fluids, digitoxin, aminophylline, vitamins, low salt diet, pentylenetetrazol (metrazol) and chlortetracycline (aureomycin). He was semicomatose most of the time, and could not be aroused. Numerous courses of monosodium glutamate were given with gratifying effect on the blood ammonia level which dropped from 225 to 148 gamma per cent.

In spite of therapy he rapidly became worse. On May 11 he developed muscular irritability and hyperactive reflexes. The blood pressure was 130/50; pulse, 112; respiration, 45; and the temperature

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

was 101.4. On May 13 he was started on 50 mg. of cortisone daily. The next day a friction rub was heard over the precordium. His average urinary output was 800 milliliters per day, but dropped to 400 milliliters one day before death.

On the day of death the Cheyne-Stokes respiration was more pronounced; the blood pressure was 70/40; pulse, 120; blood urea nitrogen, 84 mg. per cent; creatinine, 3.0 mg. per cent; carbon dioxide, 28.5 mEq; and the blood ammonia was 145 gamma per cent. The total bilirubin was 19.1 mg. per cent; direct bilirubin, 11.8 mg. per cent; and the prothrombin time was 15 seconds.

On May 15, 1956, at 8:55 p.m. the patient suddenly died.

Dr. Mahlon Delp: Are there any questions of Dr. Kilk?

Richard D. Smith (fourth year medical student): I would like to know a little about his precordial pain.

Dr. Maert Kilk (resident in medicine): He had a sharp, precordial pain which was fairly severe when he was not comatose.

Norvin D. Schuman (fourth year medical student): Did the patient have a history of heart failure eight months previous to this?

Dr. Kilk: Not that I know of.

Ralph N. Sumner (fourth year medical student): Had he ever had rheumatic fever?

Dr. Kilk: Not to my knowledge.

Joseph Struzzo (fourth year medical student): Was there any evidence of embolic phenomena?

Dr. Kilk: No.

Mr. Sumner: Were blood cultures done?

Dr. Kilk: Yes; they were all negative.

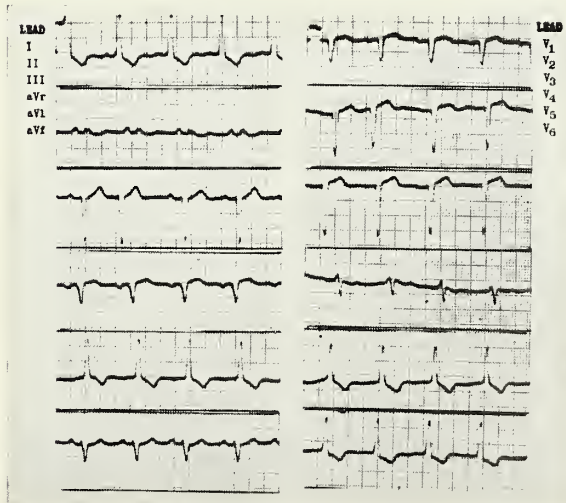


Figure 1. Electrocardiogram, March 7, 1956.

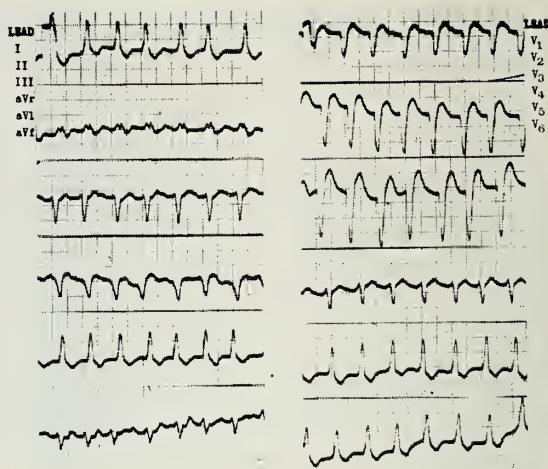


Figure 2. Electrocardiogram, May 12, 1956.

Gerald H. Siemsen (fourth year medical student): I would like to know more about his respiration.

Dr. Kilk: He had Cheyne-Stokes respiration, but he appeared quiet at the time of death.

Mack E. Sturgis (fourth year medical student): Did he have a falling blood pressure?

Dr. Delp: Yes, for several hours preceding his death, but the pulse rate remained about the same.

Mr. Siemsen: Was there cough or hemoptysis?

Dr. Kilk: No.

Mr. Sturgis: Was there a transaminase determination?

Dr. Kilk: The transaminase was 731 units.

Donald Stewart (fourth year medical student): What was the serum protein level?

Dr. Kilk: The serum proteins were: globulin, 3.2 mg. per cent; albumin, 3.7 mg. per cent.

Mr. Smith: Would you please review the neurological examination?

Dr. Delp: The neurological findings were equivocal, but I believe that there was no marked change in the reflexes in his lower extremities.

Mr. Siemsen: Can you be more specific about where the friction rub was heard?

Dr. Delp: Over the left precordium and the left chest.

Mr. Siemsen: Over a large area?

Dr. Delp: Over a rather large area. Mr. Sturgis, please demonstrate the electrocardiograms.

Mr. Sturgis: This tracing (Figure 1) was made on March 7. The rate is about 100 with a regular sinus rhythm. There is T-wave inversion in leads I, V5, and V6, and depression in the S-T segments. My interpretation is left ventricular hypertrophy and ischemia.

A second electrocardiogram, taken on May 12 (Fig-

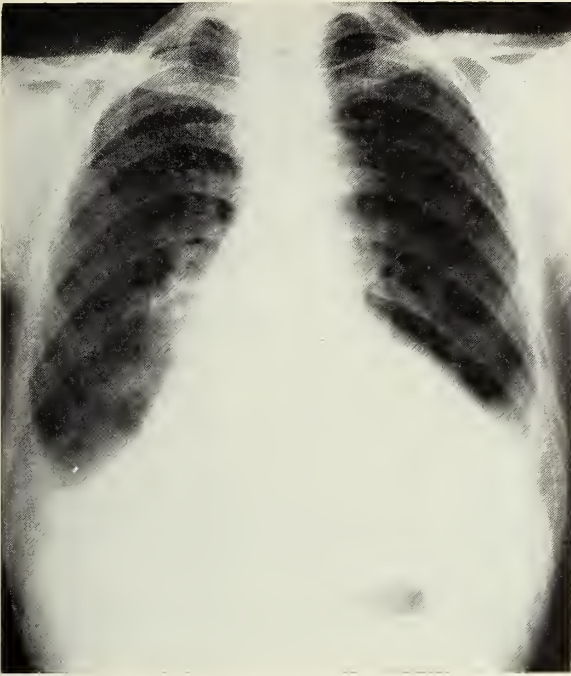


Figure 3. Chest film made on the sixth hospital day.

ure 2), shows tachycardia; I do not see a P-wave, so I interpret it as supraventricular tachycardia.

Dr. Delp: Mr. Stewart will now show the x-rays.

Mr. Stewart: The first is a chest film made on March 12, 1956 (Figure 3). There is no pathology in the bony structure, and no lung pathology except cloudiness in the right base, suggestive of congestion. The heart is considerably enlarged. The ascending aorta appears to be dilated. On March 20 there was clearing of the lung fields, but the heart was still greatly enlarged, and the ascending aorta still appeared to be dilated.

Dr. Delp: Mr. Schuman, let us have your discussion.

Differential Diagnosis

Mr. Schuman: I shall base my differential diagnosis on the causes of aortic valvular insufficiency with failure. First, I consider bacterial endocarditis; evidence in favor of this includes the heart murmur, the leukocytosis, and the patient's rapid deterioration. I rule it out because of the absence of anemia, embolic phenomena, and positive blood culture. My next consideration is syphilitic heart disease, the evidence for which includes positive serologic tests for syphilis, treatment for syphilis five years ago, aortic insufficiency, and signs of coronary insufficiency. Against this diagnosis are findings indicative of aortic stenosis, mitral stenosis (which one does not expect in pure luetic heart disease), and the description of the diastolic murmur which is not typical

of pure syphilitic aortic insufficiency. Therefore, I rule out syphilitic heart disease.

Finally, I want to consider rheumatic heart disease. The findings are indicative of involvement of both aortic and mitral valves. This patient had findings of mitral stenosis with a rumbling presystolic murmur at the apex which may have been due to organic mitral stenosis. One can have a systolic, aortic murmur with syphilitic aortitis and dilation of the aorta, but that systolic murmur is usually of less intensity than the diastolic murmur. In our patient the opposite was the case. The findings at the apex, both the systolic and the diastolic murmur, can be explained on a functional basis. The murmur of functional mitral stenosis is not usually accompanied by thrill.

In review of the differential I must emphasize that I cannot rule out syphilitic heart disease or rheumatic heart disease, but, because the systolic findings are more prominent than the diastolic, I prefer the diagnosis of rheumatic calcific aortic stenosis and insufficiency. Calcific aortic stenosis is usually associated with rheumatic heart disease.

I think that this patient had rheumatic heart disease with a calcific aortic stenosis, aortic insufficiency, and mitral stenosis and insufficiency, probably on a functional basis. The congestion of the liver caused hepatic dysfunction, portal-caval shunting of blood and elevation of blood ammonia level, hyperbilirubinemia and jaundice. It is also possible to have involvement of the kidney with renal tubular necrosis and uremia. I think the patient died in uremia with uremic pericarditis and depression of the central nervous system.

Clinical Discussion

Dr. Delp: Thank you very much for the discussion. Now I should like to know what you think of his chest pain. How do you explain it, Mr. Siemson?

Mr. Siemson: Uremic pericarditis.

Dr. Delp: Do you have a second possibility?

Mr. Siemson: Pulmonary insufficiency.

Mr. Sumner: It could have been from coronary insufficiency resulting from the calcific aortitis with occlusion of the ostia.

Dr. Delp: What about the elevation of the transaminase?

Mr. Struzzo: Myocardial infarction or liver damage.

Pathological Report

Dr. Frank Mantz (pathologist): The patient was considerably emaciated and cyanotic and showed edema of the lower extremities and distention of the cervical veins. There was 600 ml. of amber as-

citic fluid within the abdomen; 100 ml. of similar fluid within the pericardium; and 200 ml. within each of the pleural spaces.

The pertinent pathological changes were confined to the heart, lungs, liver, and brain. The heart was enlarged, weighing 810 gm., and showed a profound degree of hypertrophy of the left ventricle with a lesser degree of hypertrophy of the right ventricle. The myocardium showed no gross abnormalities. The epicardium was perfectly smooth, and nothing was found that would explain the friction rub that was heard clinically. The endocardium and valves, with the exception of the aortic valve, were normal except for uniform dilation of the valve rings. Major alteration of the aortic valve was noted. This consisted of a characteristic foreshortening and thickening of the cusps' margins (Figure 4). Associated with this, the left coronary orifice was displaced upward and completely out of the sinus of Valsava. More characteristic than anything else was the widening of the anterior commissure. Furthermore, there was a fusiform dilatation of the ascending aorta which we interpret as an early aneurysm. Associated with this is the "tree-barking" focal thickening of the intima characteristic of lues.

At the base of the aorta there was an inflammatory process characterized by a perivascular infiltration of lymphocytes and plasma cells within the adventitia, a feature practically pathognomonic of lues (Figure 5). This, apparently, was of long standing, producing patchy destruction of the elastica and fibrous replacement of the media, rendering the aorta more liable to dilatation and robbing it of its elastic recoil.

The disease of the aortic valve was not exclusively of luetic etiology. There was extensive calcification of the posterior cusps extending upward from the



Figure 4. Aortic valve and ascending aorta. Thickening of cusp margins is prominent, and the anterior commissure is widened. Note fusion of left posterior commissure, ulceration of right posterior cusp, and nodular calcification. The ascending aorta shows early aneurysmal dilatation.



Figure 5. Aorta. Perivascular inflammation of vasa vasorum in adventitia of aorta.

base of the valve itself and producing nodular protrusions (Figure 4). Furthermore, there was fusion of the posterior commissures, leaving the patient with an acquired bicuspid valve. In addition there was an extensive ulceration in the right posterior cusp suggestive of active subacute bacterial endocarditis.

Histological examination confirmed the fact that calcific aortic stenosis did exist (Figure 6). The calcific deposit was confined to the valve ring and the central portion of the cusp in the area which is frequently referred to as the fibrosa. This change is characteristic of the rheumatic type of calcific aortic stenosis; the arteriosclerotic variety more frequently involves the spongiosa of the valve itself. Furthermore, there was extensive vascularization of the valve associated with residual inflammation likewise suggestive of rheumatic disease.

The area of ulceration did not prove, on histological examination, to be active bacterial endocarditis. It appeared to be a remote process, the nature of which we can only infer. There was a penetrating

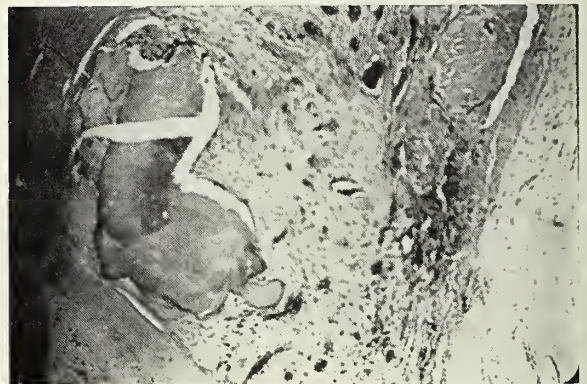


Figure 6. Calcific aortic stenosis. Note deposition of calcium in fibrosa of cusp and extensive vascularity.

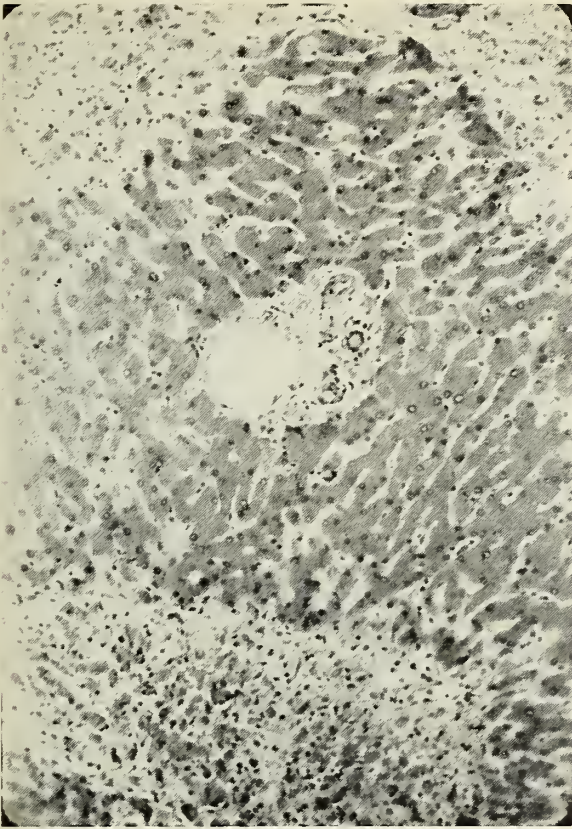


Figure 7. Liver. Marked central necrosis has reversed the usual relationship of the portal area with the central regions.

lesion extending deep into the fibrosa of the cusp and containing residual inflammatory cells showing a characteristic palisaded arrangement at the base of the lesion. It is our speculation that this represents healed sub-acute bacterial endocarditis, because of the characteristic inflammatory response. We have no way of proving or disproving this surmise.

For those who predicted that coronary insufficiency existed we can offer some support. There were areas of remote ischemia throughout the heart manifested by fibrous replacement. Examination of the coronary arteries failed to disclose any narrowing, and we must assume that the ischemia was on the basis of the malfunctioning aortic valve with myocardial hypertrophy.

The lungs weighed 1750 gm. and were exceedingly firm, exuding large amounts of frothy dark brown fluid. Scattered throughout the lower lobe on either side and also involving the lingula and the right middle lobe were focal areas of infarction of varying age and ranging from 5 to 9 cm. in circumference. The brown discoloration was caused by accumulation of hemosiderin-filled macrophages throughout the pulmonary parenchyma. Scattered

throughout the pulmonary arteries were occasional small emboli of varying age which we assume were derived either from the right atrial appendage, which did contain a mural thrombus, or from the periprosthetic veins which were thrombosed. We can infer that the relatively recent pulmonary infarcts contributed a hemolytic aspect to the patient's jaundice.

The liver showed advanced passive congestion, weighed 1500 gm., and showed characteristic rounding of the margins. The central areas were exceedingly prominent, retracted, and rather hemorrhagic. The portal areas were prominent and light yellow, suggesting a relatively high fat content. The architecture of the lobule was altered so that the relative prominence of the central and portal areas appeared reversed, a change characteristic of early passive congestion. Microscopically there was marked centrilobular necrosis. At the periphery there was considerable cloudy swelling with dissociation of the liver cords associated with narrowing of the sinusoids (Figure 7). Presumably this produced intra-lobular obstruction since the canaliculi were frequently distended with accumulated bile.

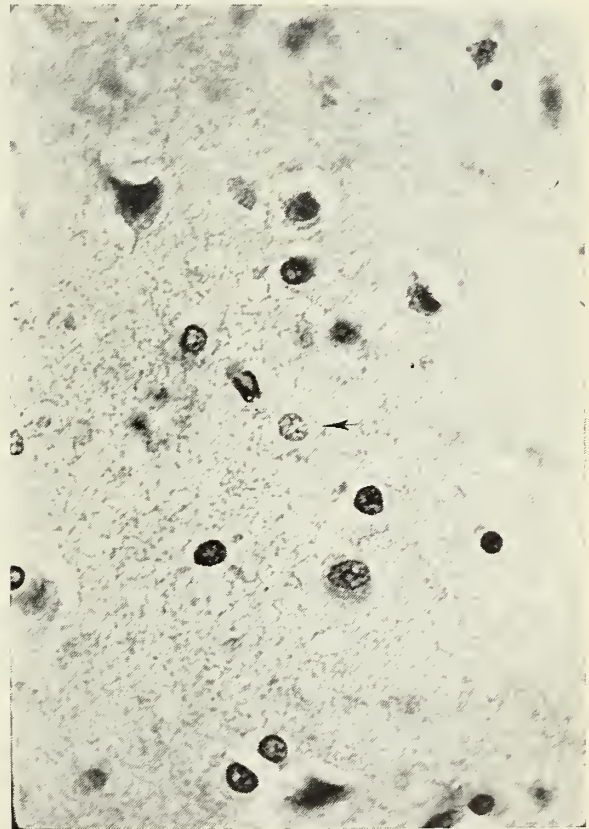


Figure 8. Brain. Note the large protoplasmic astrocytes of a type found frequently in hepatic coma.

The brain (Figure 8) likewise was of interest because of the history of anoxia, elevated blood ammonia and coma. There was evidence of generalized acute cell disease manifested by considerable chromatolysis, satellitosis, and alteration of Nissl's substances. There was also evidence that ammonia intoxication did exist in this case. Scattered throughout the brain, particularly within the diencephalon, there were astrocytes of a peculiar nature. These were large, with vesicular nuclei, and frequently showed an abundance of cytoplasm. Adams,¹ in his study of hepatic coma, found such cells to be present with a great degree of constancy. We believe this observation to be correct.

It is well known that luetic cardiovascular disease is frequently associated with involvement of the central nervous system. Such an association existed in this case. In addition to great atrophy, the cortex contained scattered rod-shaped microglia commonly found in luetic encephalitis. Furthermore, there were focal areas of glial proliferation beneath the ependyma of the fourth ventricle, producing a nodular alteration, often referred to as nodular ependymitis.

We believe that this man suffered from luetic aortic insufficiency and rheumatic aortic stenosis. The cardiac failure was engendered by this and led to passive congestion of the liver, resulting in hepatocellular degeneration and clinical impairment of hepatic function, including an elevated blood ammonia. As a result of this, and also as a result of anoxia, cerebral changes ensued. This case is interesting because it is the first one to be brought to my attention in which there was marked elevation of transaminase attributable to chronic passive congestion of the liver.

Dr. Delp: Dr. Allen, this patient, at the age of 72, was seen in the outpatient clinic, and the diagnosis of syphilitic heart disease was made. It was suggested that he should be treated with penicillin, and he was. Do you have any comments?

Dr. Max Allen (internist): There have been some discussions about the danger of treating syphilitic patients with narrowed coronary ostia with penicillin. The work done in our clinic disproves that danger. We have not experienced any trouble with penicillin therapy. There may be some danger with arsenic.

Dr. Delp: The fact that this patient had intractable heart failure is one of the strongest reasons for suggesting that he had syphilitic heart disease, but the character of his murmurs certainly makes this case resemble rheumatic heart disease. The other interesting thing is the elevation of his transaminase, and the fact that this patient did have ammonia in-

toxication with the neurologic complications that go along with that metabolic disturbance.

Pathological Anatomical Diagnosis

Primary

Luetic cardiovascular disease with fusiform aneurysm of the ascending aorta and aortic valvulitis.

Calcific aortic stenosis with fusion of posterior cusps consistent with healed rheumatic aortic valvulitis.

Focal ulceration of the right posterior cusp of the aortic valve consistent with healed subacute bacterial endocarditis.

Hypertrophy and dilatation of the left ventricle with focal myocardial fibrosis.

Organizing mural thrombi of both auricular appendages.

Nodular hyperplasia of the prostate and acute prostatitis, advanced, with thrombosis of periprostatic veins.

Acute and chronic passive congestion of the lungs.

Multiple small, relatively remote and recent emboli in pulmonary arteries with multiple hemorrhagic infarcts of the lungs.

Sanguineous pleural effusions: 200 ml., right; 600 ml., left.

Dilatation and hypertrophy of right ventricle.

Acute and chronic passive congestion of the liver with central necrosis, advanced.

Chromatolysis, satellitosis, hyperplasia of large pale astrocytes and edema of brain with perivascular hemorrhages consistent with ammonia intoxication.

Generalized jaundice, advanced.

Acute and chronic passive congestion of the spleen, kidneys and gastrointestinal tract, advanced.

Ascites, 600 cc., and peripheral edema, moderate.

Inactive luetic encephalitis.

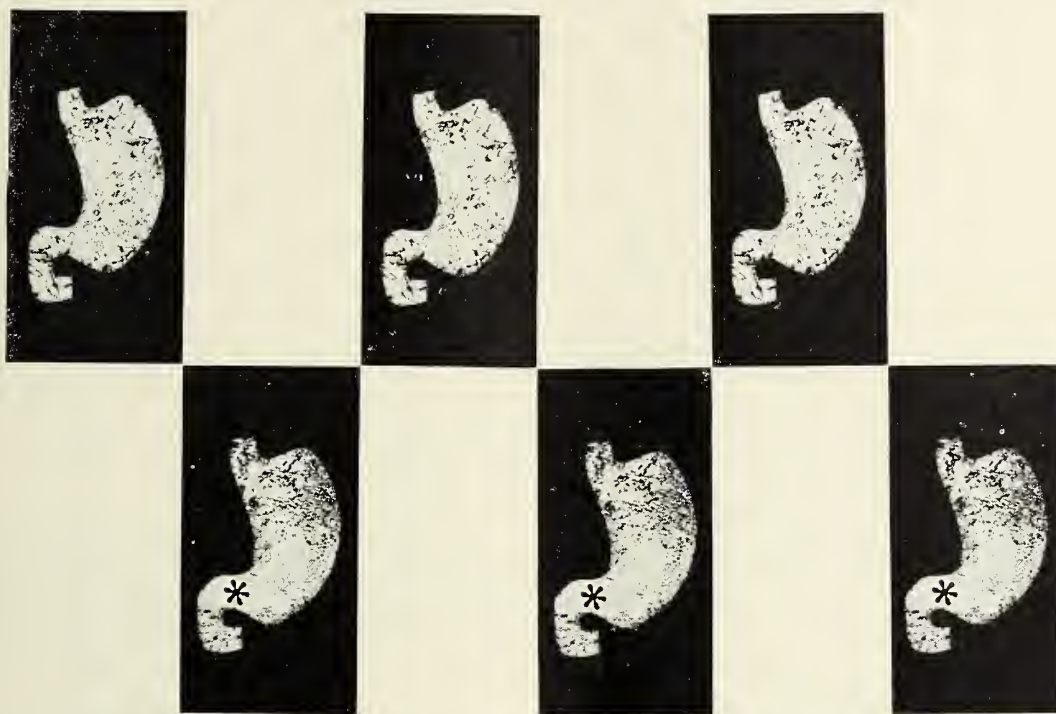
Summary

Dr. Delp: A most resistive form of congestive failure was, as is often true, complicated by metabolic failure and ammonia intoxication terminally. This central nervous system intoxication is not an uncommon end result of liver damage coming on with severe congestive hepatomegaly.²

Preventive treatment of the heart lesion with penicillin late in the patient's life was certain to fail, and was made more surely so here by the presence of coexisting rheumatic valvular disease.

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TRUE ANTICHOLINERGIC ACTION

Pro-Banthine® Inhibits Excess Parasympathetic Stimuli in Peptic Ulcer

Medical literature now contains more than 500 references to the beneficial role of Pro-Banthine Bromide (brand of propantheline bromide) and Banthine® Bromide (brand of methantheline bromide) as evidenced by a marked healing response of peptic ulcers. Rapid symptomatic improvement, particularly with reference to pain relief, is followed by roentgenographic demonstration of crater filling.

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The initial suggested dosage is one tablet, 15 mg., with meals and two tablets at bedtime. An increased dosage may be necessary for severe manifestations and then two or more tablets four times a day may be indicated. G. D. Searle & Co., Chicago 80, Illinois, Research in the Service of Medicine.

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BLUE SHIELD

What Makes Blue Shield Different?

One frequently hears doctors ask, "Isn't Blue Shield just 'another insurance company'?" This question usually comes from a member of the generation of new doctors who have come into practice since the early '40's, and who know little of the desperate challenge that gave rise to the Blue Shield idea and the hard work with which its accoucheurs gave it birth.

Blue Shield represents a vast and triumphant effort on the part of American medicine to prove to the people of the United States that, with their help, their doctors can solve urgent problems of medical economics without governmental interference or dictation. Blue Shield was created at a time when the insurance industry questioned the actuarial feasibility of voluntary medical care insurance on any large scale, and even many doctors feared that a voluntary program would inevitably lead to a compulsory health insurance system under government auspices.

Blue Shield has little in common with commercial accident and health insurance beyond the fact that it utilizes actuarial principles. Where the insurance company underwrites selected groups to produce a profit, Blue Shield, reflecting the service ideals of the medical profession, makes its services available to the entire community, at rates based on the needs and experience of the community—including most particularly those people in the low income groups who need medical prepayment protection.

Where commercial insurance companies offer cash allowances which may or may not have any relation to the doctor's normal charge for his services, Blue Shield's schedules of payment are negotiated and approved by the local medical profession. In most areas Blue Shield benefits take the form of fully paid professional services, through the cooperation of the "participating physicians." Even where "service benefits" are not provided by formal agreement of the doctors, plan schedules generally attempt to approximate the normal charges of local physicians for services rendered people in the lower income brackets, and local physicians frequently accept these fees as full payment.

Blue Shield Plans are distinguished by non-profit operation, which means that their only purpose is service to the people and their doctors. Non-profit operation also means that all funds contributed by subscribers are available for payment of benefits, with a minimum retained for actual operating costs and reserves for future claims.

Over and above all requirements of state law, Blue Shield Plans are required to maintain strict "membership standards" in order to use the name and symbol "Blue Shield." These standards provide that the plan must have the continuous approval of the local medical society; must render an annual report to the society; and must secure the formal participation of at least 51 per cent of all physicians in the plan area. In Kansas, 95 per cent of the medical doctors (nearly 1,800) are Blue Shield participating physicians.

Blue Shield utilizes insurance principles, but, because of the participation of the great majority of American physicians, it is able to transcend the limits of insurance—to become a true community service on behalf of America's physicians.

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DEATH NOTICES

HENRY EDGAR HASKINS, M.D.

Dr. H. E. Haskins, 78, who was in his 55th year of medical practice, died at Kingman Memorial Hospital on February 1, two days after having suffered a heart attack. A graduate of Beaumont Hospital Medical College, St. Louis, in 1901, Dr. Haskins returned to Kansas immediately to start practice in Kingman in association with his father. The two later founded the Kingman Memorial Hospital.

Recognition for 50 years of practice was given by the Kingman community in May of 1952, and further recognition was given the following year when Dr. Haskins represented Kansas at the first Western Hemisphere Conference of the World Medical Association at Richmond, Virginia.

Dr. Haskins held many offices in his county and state medical societies and was also a member of the Kansas State Board of Medical Registration and Examination for a number of years.

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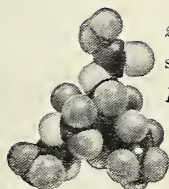
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Maternal Hypofibrinogenemia

A Study of Coagulation Defects in Pregnancy

ROBERT N. SMITH, M.D., *Panama Canal Zone*

Hemorrhage is among the leading causes of maternal death in the United States. During the last few years it has become evident that certain instances of hemorrhage during pregnancy have been associated with disturbances in the blood clotting mechanism.

DeLee¹ was called in 1901 to attend a case of abruptio placentae with uncontrollable hemorrhage. He made the observation that the patient's blood failed to clot even after several days and described the condition as a "temporary hemophilia."

Willson²⁴ in 1922 reviewed a number of cases associated with bleeding phenomena and attributed these to the liberation of a hemorrhagic toxin by the placenta.

The nature of this hemorrhagic phenomenon was not investigated systematically until recently. The first demonstration of the nature of the defect was made in 1936 by Dieckmann,² who found significantly reduced levels of blood fibrinogen in patients who suffered hemorrhage following abruptio placentae.

It must be realized that knowledge of this subject is in its beginning stages. One should be cautious in accepting generalizations drawn from the few carefully observed cases which have been reported.

Mechanism of Coagulation

Though it is not within the scope and purpose of this paper to go into the intricacies of blood coagulation, a short discussion of its mechanism is relevant. It is still evident after many years of study and research that the entire mechanism of blood coagulation is not fully understood. Therefore a simplified concept will be given to the reader, and no attempt will be made to go into the controversies of the subject.

Thrombin is an enzyme which acts on blood fibrinogen, a soluble protein, to convert it to fibrin, an insoluble protein. This is probably a polymerization reaction. The fibrinogen molecules form needle-shaped protofibrils which become aligned into fiber

strands. They are extremely adhesive and possess the capacity to contract. This reaction takes place in about nine minutes in a normal blood sample. Fibrinogen is a globulin with a molecular weight of ca. 410,000. The molecule is three or four times as large as other plasma proteins.^{5, 15}

Thrombin, normally not present in blood, has its origin in prothrombin. Prothrombin is present in the circulating blood in a concentration of about 20 mgm. per 100 cc. Prothrombin is activated by calcium, thromboplastin, Ac-globulin, platelet derivatives, and possibly some substances that are not recognized as yet.¹⁵

Thromboplastin is widely distributed in the body as an intracellular substance, particularly in the lungs, brain, and kidney in the nonpregnant animal. It is present to a much greater degree in the placenta and decidua of the pregnant animal.¹⁴

Accelerator globulin is one of the newly recognized clotting factors. It acts together with thromboplastin and calcium to activate prothrombin rapidly.^{7, 15} The mode of action by which Ac-globulin accelerates the conversion of prothrombin to thrombin is unknown.

It is known that the platelets furnish an agent which accelerates the interaction of thrombin and fibrinogen.²⁵ The platelets also contain an accelerator which catalyzes the change of prothrombin to thrombin by thromboplastin and calcium ions.

The fluidity of the blood is maintained by the balance between the system for prothrombin activation and the system of inhibitors of prothrombin activation. One of the inhibitors is heparin which interferes with the action of thrombin on fibrinogen.

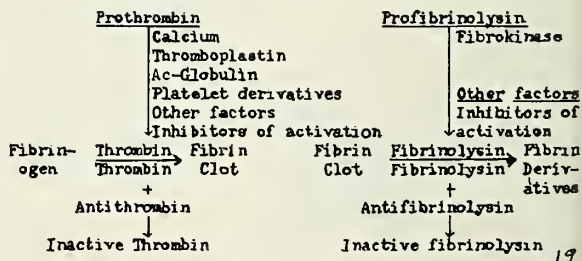


Figure 1

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Smith is now serving his internship at Gorgas Hospital, Panama Canal Zone.

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Another is antithromboplastin which is believed to inactivate thromboplastin. A number of other anticoagulant factors have been studied, but their character is obscure.¹⁵

Human plasma also contains a potent proteolytic enzyme capable of dissolving a clot. This enzyme fibrinolysin (plasmin) is ordinarily in an inactive form, profibrinolysin (plasminogen), a protein normally found in the plasma. It can be activated by fibrinogen, of tissue origin, and perhaps by other physiological mechanisms. Plasma is not only potentially fibrinolytic but also has strong plasmin-inhibiting activity, antifibrinolysin (antiplasmin), which can destroy the activity of the fibrinolysin itself.^{15, 25}

Average Fibrinogen Values

Peterman⁹ states that the fibrinogen content of blood plasma remains fairly constant in the normal non-pregnant individual, being stabilized somewhere between 250 and 350 mgm. per cent. The average fibrinogen level of normal non-pregnant women is 260 mgm. per cent, according to Dieckmann.³ In normal pregnancy there is an increase to an average of 480 mgm. per cent at term with a further increase during the first postpartum week. There is an average increase in plasma fibrinogen of about 40 per cent at term.

In eclampsia the blood fibrinogen level becomes high with an average of 660 mgm. per cent at term. In preeclampsia the average fibrinogen concentration at term is 510 mgm. per cent.

Hemorrhagic States in Pregnancy

Under a variety of conditions associated with pregnancy and occurring at or near the time of parturition, a more or less transitory abnormality sometimes appears in the clotting mechanism which may be responsible for uterine and generalized bleeding. These syndromes include premature separation of the normally implanted placenta, amniotic-fluid embolism, retention of a dead fetus in utero, hydatidiform mole, eclampsia, and severe preeclampsia. It also has been observed to occur following criminal abortion and lung surgery.¹¹

Experimental Studies

Weiner and his associates²³ advanced three possible explanations to account for the hypofibrinogenemia they observed. One possible explanation was that a toxic placental or fetal substance was depressing the production of fibrinogen by the liver. They believed this unlikely since hepatic function was normal in their patients. Ratnoff et al.¹⁰ noted that fibrinogen given to the patient intravenously disappeared within a few hours. This cannot be explained on the basis of this theory.

The second hypothesis proposed by Weiner and his coworkers²³ was that circulating fibrinogen may be removed by excessive plasma proteolytic activity. However, various investigators have not been able to establish the presence of an active fibrinolysin in this condition with any degree of consistency. Also the concomitant reduction of prothrombin and Ac-globulin as well as fibrinogen cannot be explained by the action of fibrinolysin.⁵ The existence of fibrin emboli and retroplacental clots is further evidence against this mechanism.

The third hypothesis proposed by Weiner et al.²³ was that clotting had occurred intravascularly. The data presented make this seem to be a reasonable hypothesis.

The problem was first studied by injecting tissue extracts into experimental animals intravascularly. The material used was simple, crude, saline extract of various tissues. Schneider¹⁴ was able to show that the active principle was actually tissue thromboplastin. He theorized that since heparin blocks the blood clotting mechanism by blocking the activation of prothrombin, i.e., by blocking the formation of thrombin from prothrombin under the influence of thromboplastin, heparin should provide protection against placental toxin. This was found to be the case in vivo experiments. He found that he could produce intravascular coagulation by injecting thromboplastin. He also found that he could protect these animals by giving heparin intravenously either before or with the thromboplastin. These findings are in agreement with those of Thomas.²¹

The basic lesion produced in those animals that die at once is microscopic and characteristic. It may be described as a disseminated thrombo-embolism of the pulmonary arterial vasculature.¹⁵ The structure of these thrombo-emboli indicates that fibrin elements have been deposited by increments under tension from the flowing arterial circulation. The filaments of fibrin are oriented with the longitudinal axis of the vessels. There are few erythrocytes but relatively many leucocytes enmeshed in these thrombo-emboli.⁸ These characteristic fibrin structures have been observed in different parts of the greater circulation, especially in the brain.

The experimental lesions described above appear to be the result of intravascular fibrin formation. However, animals that survive a sublethal dose of thromboplastin may develop one or more complications from the resultant depletion of fibrinogen. First, there is a lack of response to further injection of thromboplastin. Fulton and Page⁵ have shown not only that animals in this state of resistance are markedly deficient in fibrinogen, but that sensitivity to the thromboplastin extracts could be restored by



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artificially replenishing the plasma fibrinogen. Similarly the sensitivity returns upon natural replenishment of the fibrinogen by the animal's own liver.

In these animals the injection of thromboplastin has caused an intravascular defibrination.

Schneider¹⁵ also found it possible to cause pregnant animals to develop numerous difficulties by traumatizing the placenta. To perform this experiment, he made abdominal incisions and traumatized the placentas of pregnant rabbits by repeated manual compression through the intact uterine wall until complete placental separation had taken place. There was evidence that the active agent was thromboplastin, and its source was the maternal placenta. Death resulted from disseminated pulmonary thromboembolus. Trapped within these thrombo-emboli were formed elements derived from the maternal portion of the placenta. Among the surviving rabbits there were also perivascular hemorrhage and local necrosis within the brain. There was liver necrosis which was comparable microscopically and grossly with that following thromboplastin injection. Schneider¹⁵ was able to induce the release of thromboplastin from a vulnerable portion of the conceptus into the maternal circulation.

Let us turn now to the human. Schneider¹⁶ believes he has evidence leading to the conclusion that thromboplastin does gain access to the maternal circulation in human pregnancy.

Almost any tissue or body fluid may serve as a source of thromboplastin.

TABLE I
QUANTITY OF THROMBOPLASTIN OBTAINED
FROM VARIOUS TISSUES

| Source material | Thromboplastin Units per gram of tissue * |
|-----------------------|---|
| Amniotic fluid | 1 |
| Liver | 10 |
| Skeletal muscle | 20 |
| Kidney | 50 |
| Brain | 50 |
| Lung | 200 |
| Placenta | |
| First trimester | 2000 |
| Term | 200 |
| Decidua | |
| First trimester | 2000 |
| Term | 1500 |

* One unit of thromboplastin is the minimum lethal dose required to kill a 20-gram mouse.

Table I shows that the placenta is rich in thromboplastin, especially early in pregnancy. The decidua is

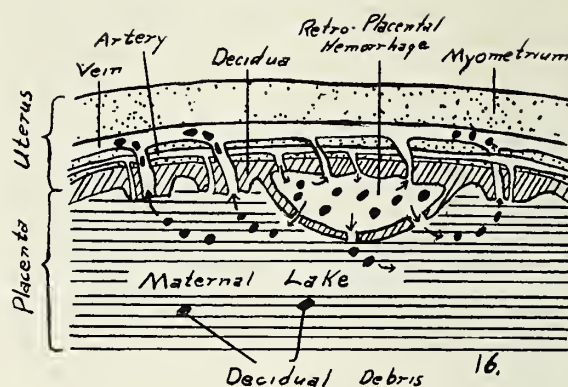


Figure 2

unusually rich and remains so even at term. The amount of this potent material in these tissues, plus their anatomic relation to the maternal circulation, demands that one consider that thromboplastin from these tissues can get directly into the maternal circulation.

Figure 2 presents a hypothetical mechanism through which this might occur. A spontaneous hemorrhage into the degenerating decidua mixes maternal blood with decidual debris and tissue juices, all rich in thromboplastin. This mixture could then escape through breaks in the fragile basal plate into the maternal or intervillous lake of the placenta. From there the mixture could gain entrance to the general maternal circulation. Complications may result, including "fibrin embolism" because of initiation of coagulation within the circulating blood.

Schneider¹⁶ found and described two retroplacental hematomas, each still in situ on its delivered placenta. One was a self-limiting retroplacental hematoma from a case of eclampsia, the other an extensive hematoma from a case of clinically diagnosed abruptio placentae. Each case demonstrated partial defibrination clinically. Study of microscopic sections revealed lacerations of the basal plate in both placentas. It was inferred that at the time of rupture of the basal plate, a thromboplastic mixture escaped into the maternal lake and then into the maternal circulation.

Detection of Hypofibrinogenemia

A rapid, quantitative test to determine the value of the plasma fibrinogen is of prime importance to the clinician. Unfortunately patients for whom this test would be desirable do not always present themselves to the physician during the hours when the services of the laboratory technician are readily available. Therefore the physician himself should become familiar with a method of detecting defibrination.

Weiner et al.²² advocated the "clot observation test." This test is done by observing the stability of



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the clot formed in unanticoagulant-treated venous blood incubated at 37 degrees Centigrade for one hour. It is not only a good test for the detection of defibrination but is also useful for evaluating the effectiveness of therapy.

In correlating serial fibrinogen values with clot stability it appears that blood containing approximately 150 mgm. fibrinogen per 100 cc. of plasma serves as the dividing line between clot stability and clot instability. When the approximate fibrinogen range per 100 cc. of plasma varies between 150 mgm. and 100 mgm., partial clot dissolution with separation of red cells is evident. Soft fragile clots formed which promptly dissolved between 100 mgm. and 60 mgm. per 100 cc. of plasma. Blood containing less than 60 mgm. fibrinogen per 100 cc. of plasma fails to clot.⁶

Between the values 250 mgm. and 150 mgm. per 100 cc. of plasma, fibrinogen depression occurs without recognizable clinical symptoms to justify the designation "sub-clinical" defibrination. Below 150 mgm. per 100 cc. of plasma, fibrinogen depression is accompanied by symptoms characteristic of the "clinical" disease. Below the critical level of 100 mgm. to 90 mgm. per 100 cc. of plasma, complete failure of the coagulation mechanism becomes evident. This may be characterized by generalized hemorrhagic symptoms such as epistaxis, hematuria, melena, gingival bleeding, and bleeding at the sites of venipunctures.^{6, 11}

Abruptio Placentae Syndrome

In the abruptio placentae syndrome the degree of defibrination is directly proportional to the severity of placental abruption. Schneider's¹⁶ opinion that the defibrination may be selflimited when resulting from abruptio placentae was confirmed by Hodgkinson et al.⁶ He was also able to demonstrate by serial fibrinogen studies that placental abruption preceded fibrinogen depression. The defibrination was generally progressive as long as the abruptio process continued. Termination of pregnancy abruptly reversed the downward trend.

If, as it appears from the foregoing statements that the underlying pathologic process is a progressive one, beginning with intravascular coagulation and proceeding essentially to defibrination, it follows that the appropriate treatment might be quite the opposite during the two phases of this continuous process. During the coagulative phase, the use of anticoagulants may conceivably be appropriate to prevent or reduce complications that might be anticipated to result from disseminated fibrin deposition. If this were to be attempted, due precautions should be taken as regards both mother and fetus.^{14, 17}

By contrast, if the patient were to be first seen

after the coagulative process had essentially reached completion, the desirable treatment would be the prompt replacement of blood loss and institution of measures to combat shock. Secondly she should be given an intravenous injection of at least two to six grams of purified human fibrinogen in an attempt to reestablish blood fibrinogen concentration to normal values. If fibrinogen is not available, fresh whole blood may be used. However, Weiner et al. state that for each pint of blood with a fibrinogen level of 250 mgm. per cent, the effective increase would only be about 10 mgm. per 100 cc. of plasma. One good alternative is the use of quadruple strength small pool plasma. One pint yields 4.4 grams of fibrinogen.^{6, 11}

Next, measures should be taken to empty the uterus. If the cervix is not long and closed, and amniotomy can be performed readily, this procedure should be carried out. However, if labor does not follow promptly, if it is difficult to keep the patient out of shock, or if laboratory studies show that fibrinogen depletion is continuing at a rapid rate, it is probably in the best interest of the patient to empty the uterus promptly by cesarean section. No surgical procedure should be attempted, however, without first restoring the blood coagulation mechanism.^{6, 11}

Amniotic Fluid Embolism

Steiner and Lushbaugh²⁰ first described amniotic fluid embolism in 1941. The amniotic fluid enters the maternal circulation just before, during, or shortly after childbirth. In about two-thirds of the reported cases, the women have been 30 years of age or older, and most have been multiparous. In at least half the cases labor has been excessively severe and rapid. Typically, severe respiratory distress with dyspnea and cyanosis suddenly develops and the patient dies within a matter of minutes. If the patient survives the initial shock of amniotic fluid embolism, there is usually gross uterine hemorrhage which does not always respond to supportive measures. At autopsy, evidence of embolization of the maternal circulation by amniotic fluid is present; lanugo hairs and desquamated fetal epithelium can be found in the mother's pulmonary vessels.⁶

In amniotic fluid embolism it is not clear whether intravascular coagulation or fibrinolysis is the major etiological factor. Reid et al.¹³ claim that amniotic fluid embolism induces intravascular coagulation. The low thromboplastin activity of amniotic fluid and the delivery of intact ovisacs, in a certain number of cases with hypofibrinogenemia, speak against this theory. It appears reasonable also to assume that amniotic fluid embolism leads to shock and consequent fibrinolysis.¹²

Treatment consists of the measures outlined in the abruptio placentae syndrome: replacement of blood

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loss, administration of two to six grams of fibrinogen intravenously, and rapid digitalization. Amniotomy should be carried out if possible, but other surgical procedures are probably contraindicated.

If the patient should exhibit signs of obstetric shock but no blood loss, one should be cautious about rapid intravenous infusions of either blood or fluids. The patient's already embarrassed pulmonary circulation makes her a likely candidate for pulmonary edema with possibly a fatal consequence.

Intrauterine Retention of Fetus

A third cause of hypofibrinogenemia in pregnancy is the intrauterine retention of a dead fetus. When the "dead fetus syndrome" was first described by Weiner et al.,²³ it was suggested that maternal-fetal Rh incompatibility was an essential etiologic feature. Later it was found that the Rh factor was only of apparent etiologic importance, and its relationship to the syndrome was incidental to the increased frequency with which intrauterine death occurred in maternal-Rh isoimmunization. Hypofibrinogenemia has not been reported in cases in which fetal death occurred earlier than the fourth month of gestation, nor has hypofibrinogenemia been noted in less than five weeks after the apparent death of the fetus.¹⁰

Mechanisms responsible for the hypofibrinogenemia are not known. One hypothesis suggested is that the maternal fibrinogen is destroyed as the result of fibrinolysis. If fibrinolysis were the only abnormality, one would not expect a concomitant drop of fibrinogen, prothrombin, and Ac-globulin, which can be marked at times.

A more plausible explanation for hypofibrinogenemia is that the fibrinogen is consumed by intravascular coagulation. This view is supported by the observation that intravenously injected fibrinogen disappears from the circulation with great rapidity.^{10, 12} Perhaps thromboplastin material, from the placenta, the dead fetus, or the amniotic fluid, gains entrance to the maternal circulation. No evidence has been reported that decreased synthesis of fibrinogen is responsible for the hypofibrinogenemia.

A change in the traditional attitude of "watchful expectancy" in the management of missed abortion and dead fetus in utero may well be overdue. Prophylactically, patients in whom there is retention of a dead fetus should be warned to report any evidence of bleeding, however trivial. Determination of the fibrinogen concentration should be started in the third week after fetal death and should be repeated at weekly intervals. It is probable that the "hands off" policy should be followed as long as weekly plasma fibrinogen values range above 150 mgm. per 100 cc. of plasma. In the range between 90 and 150 mgm. per 100 cc., the frequency of serial blood sampling

should be increased to several times daily, and preparations should be made for delivery.^{6, 11}

The method and time for interruption of pregnancy in the "dead fetus syndrome" depend upon obstetric conditions. A long, hard, undilated cervix is probably sufficient indication for hysterotomy.¹² If the condition of the cervix is favorable for delivery, amniotomy is probably a wise procedure. Emptying the uterus, after intravenous injection of human fibrinogen, corrects the defect promptly.

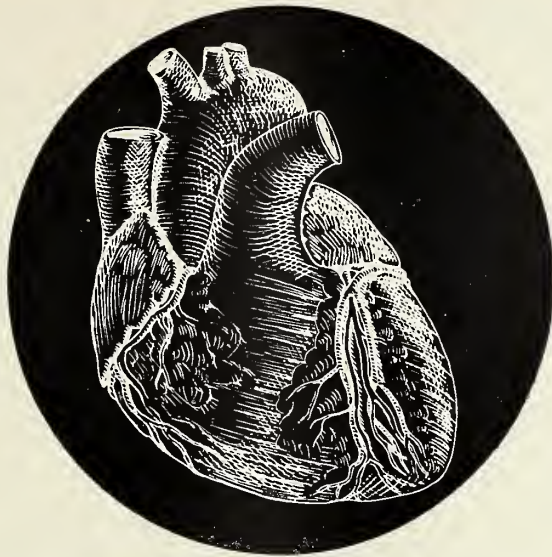
Summary

In some patients with abruptio placentae or amniotic-fluid embolism, hypofibrinogenemia may develop acutely and may be associated with both uterine and generalized bleeding. The cause of the hemorrhagic phenomena in these two conditions is unknown. It is conjectured that thromboplastic material enters the maternal circulation and causes intravascular coagulation, with subsequent defibrination. Treatment in both disorders should include intravenous injection of human fibrinogen and measures to combat shock. In abruptio placentae the uterus should be emptied, preferably by vaginal delivery. In amniotic-fluid embolism conservative management has been more effective.

A third cause of hypofibrinogenemia in pregnancy is the intrauterine retention of a dead fetus. In these cases fetal death usually occurs in the fourth month of gestation or later, and hypofibrinogenemia has been noted five or more weeks thereafter. The mechanism responsible for hypofibrinogenemia is unknown. These patients should be studied frequently for evidence of bleeding or hypofibrinogenemia. Emptying of the uterus after intravenous injection of human fibrinogen corrects the defect promptly.

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Members of the Wyandotte County Society entertained their wives and office assistants at a dinner meeting at the Town House Hotel, Kansas City, on February 19.

Members of the Auxiliary were guests of the Cowley County Medical Society at a dinner held at the Winfield Country Club recently. Dr. Glen Floyd later addressed the physicians' group on the subject of "Diseases of the Eye."

Dr. and Mrs. Roswell E. Capsey, Centralia, entertained members of the Nemaha County Society and its Auxiliary at a buffet supper at their home recently. During a separate scientific meeting which followed, the physicians saw a film on cancer prepared by the Upjohn Company and presented by an Upjohn representative, Mr. Del Saunders.

Officers of the Smith County Society were elected at a meeting held at Smith Center recently. Dr. Frank H. Relihan is now serving as president, Dr. Hugh J. Woods as vice-president, Dr. Victor E. Watts as secretary-treasurer, and Dr. Dennis A. Hardman as delegate to the state meeting.

A meeting of the Leavenworth County Society was held at Leavenworth on February 11. Members made plans for a number of public relations and public service projects, polio immunization, 24-hour telephone service, and formation of a grievance committee.

An engraved gold watch was presented to Dr. Eugene J. Bribach, Atchison, at a recent meeting of the Atchison County Society. The occasion was Dr. Bribach's anniversary of entering the practice of medicine, his 50th. Dr. Frederick Wrightman, Sabetha, councilor for that district of the Kansas Medical Society, addressed the group.

A remarkable increase in cancer deaths since the beginning of the 20th century is shown in the statistical tables of the World Health Organization. Among many possible causes of this rise, the aging of the population should be mentioned. Furthermore, in the past 50 years other causes of death such as the infectious diseases have lost much of their importance, thus increasing the proportion of some other conditions as cause of death.

COUNTY SOCIETIES

Dr. Samuel Zelman, Topeka, spoke on "Liver Function Tests—A Clinical Evaluation" at a meeting of the Shawnee County Society held on February 4. At the business session Dr. H. H. Woods was elected to honorary membership and Dr. A. G. Stutz was elected to active membership.

"Lymphomas in Childhood" was the subject discussed by Dr. William G. Klingberg, St. Louis, at a meeting of the Sedgewick County Society on February 5. Speaker at the next meeting, on March 5, was Dr. Francis M. Ingersoll, Boston, who spoke on "Polycystic Ovarian Syndrome and Indicated Surgery."

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PHYSICIANS' ACTIVITIES

Dr. Condon T. Hagan, Wichita, addressed a district meeting of medical technologists in Wichita recently on the subject of "Heart Catheterization."

After a six months' sabbatical leave in Europe and Asia, **Dr. E. Grey Dimond** has returned to the University of Kansas Medical Center where he is professor of medicine and chairman of the department of medicine.

Dr. C. R. Openshaw, who served at the Hutchinson Naval Air Station during a term of duty with the Navy, has returned to Kansas to practice surgery in Hutchinson. A graduate of the University of Utah, Dr. Openshaw had a three-year fellowship in surgery at the Mayo Foundation, followed by a two-year fellowship in thoracic surgery.

The Marshall County Board of County Commissioners has named **Dr. George I. Thacher**, Waterville, county health officer.

Dr. Herbert Modlin, lecturer in psychiatry at the University of Kansas Medical Center, went to Cincinnati last month to address the Industrial Management Club on "Psychiatry in Industry."

The Mentor Study Club at Hillsboro held an open meeting recently at which **Dr. Herman F. Janzen**, Hillsboro, was speaker. He discussed "Prevention and Treatment of Heart Conditions."

Dr. Charles C. Coady, Kansas City, retired as medical director of the Buick-Oldsmobile-Pontiac assembly plant in Kansas City on February 1. **Dr. Harold Y. Allen**, who had been on the plant's medical staff since last April, took over the duties of director.

"Criteria for Satisfactory Colectomy for Carcinoma of the Left Colon with Description of Early High Ligation of the Inferior Mesenteric Vein" was the subject discussed by **Dr. Stanley R. Friesen**, of the University of Kansas Medical Center, when he spoke before the Central Surgical Association at a meeting in Chicago on February 21.

Dr. Daniel V. Conwell and **Dr. C. J. Kurth**, Wichita, were speakers at a meeting held in Arkansas City on February 6 under sponsorship of the Cowley

County Association for Mental Health. Dr. Conwell discussed "Everyday Care of Mental Patients," and Dr. Kurth spoke on "Proper Management of Mental Cases."

Dr. Eugene J. Bribach, Atchison, was guest of honor at a dinner at the Bellevue Country Club, Atchison, on January 22, in recognition of his completion of 50 years of practice.

Dr. Leroy A. Calkins, of the University of Kansas Medical Center, was a speaker at a refresher course in obstetrics and gynecology presented at the University of North Carolina last month.

Recognition for having practiced 54 years in Manhattan was given **Dr. William H. Clarkson** recently when the Manhattan Chamber of Commerce held its annual dinner.

Dr. Forrest L. Loveland, Topeka, resigned his position as plant physician for the Goodyear Tire and Rubber Company of Kansas on February 1. He was succeeded in the position by **Dr. John W. Cavanaugh**.

Dr. Z. Miles Nason, Kansas City, was speaker at a recent meeting of the Kansas City Ministerial Alliance. He discussed the work on the Kansas State Commission on Alcoholism.

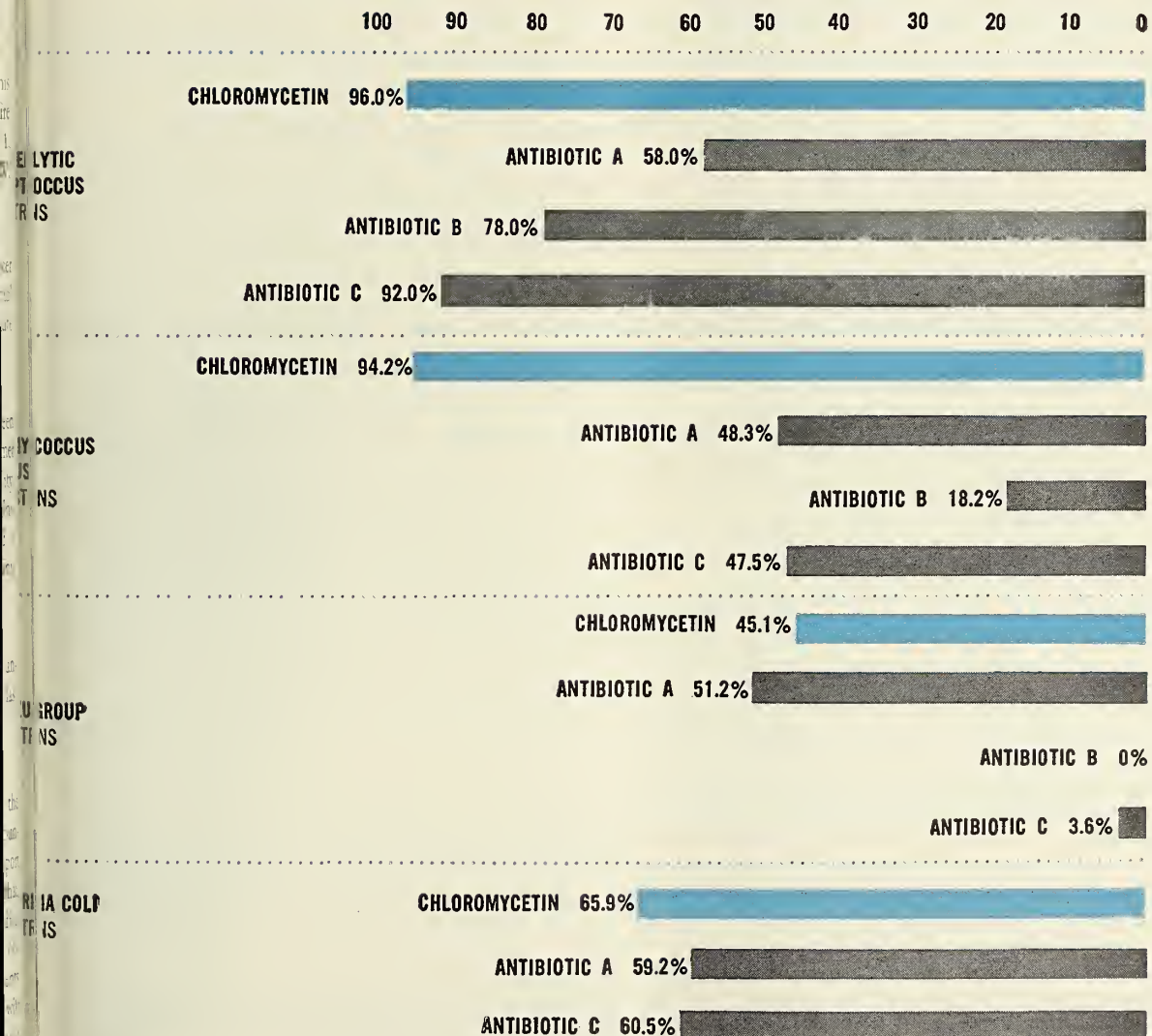
An office for the practice of surgery has been opened in Pittsburg by **Dr. John G. Esch**, former staff surgeon at the VA Hospital in Johnson City, Tennessee. Dr. Esch, a graduate of Creighton University School of Medicine in 1948, completed a three-year fellowship in surgery at Cleveland Clinic before entering practice.

Dr. Benjamin H. Mayer, Ellsworth, has announced his retirement from practice, effective last month.

The University of Tennessee is the largest of the 76 approved four-year medical schools in the country on the basis of total enrollment. A recent report by the American Medical Association shows that, during the 1955-1956 academic year, five medical schools had a total enrollment of more than 600 each. The University of Tennessee had 781 students. It was followed by the University of Michigan with 762, Jefferson at Philadelphia with 677, the University of Illinois with 636, and the University of Texas at Galveston with 614.

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THE JOURNAL *of the* KANSAS MEDICAL SOCIETY

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Volume LVIII

APRIL, 1957

No. 4

Medical Services

Distribution of Physicians and General Hospital Beds in Kansas in 1955

E. V. THIEHOFF, M.D., *Kansas City*

There is today widespread interest in the distribution of physicians and their services, as well as in the distribution of general hospital facilities. We hear that there is uneven distribution of all of these, and in some communities there is an actual deficiency in medical services. Because of this, it seemed appropriate to survey the problem as it exists in Kansas today.

Dr. Franklin D. Murphy became dean of the University of Kansas School of Medicine in 1948 and shortly thereafter instituted his now well known "Kansas Rural Health Plan." A part of this plan was to improve health care in rural communities by influencing young, recently graduated physicians to locate in rural communities to practice general medicine. We were especially interested in determining the number and percentage of physicians graduating from the School of Medicine of the University of Kansas who stay in Kansas to practice medicine, as well as in the number who, in accordance with the Kansas Rural Health Plan, go to small Kansas communities to practice.

This study was made with the cooperation of the Kansas Medical Society, the Kansas State Board of Medical Registration and Examination, the Division of Hospital Facilities of the Kansas State Board of Health, and the various Kansas hospitals having interns and residents.

The author is chairman of the Department of Public Health and Preventive Medicine, University of Kansas Medical Center. Acknowledgement is made of the many services rendered by Mrs. Phyllis Winter in the collection of data.

In the collection of data reference was made to:
American Medical Association Directory. 18th ed. 1950.

Directory of Medical Specialists. Volume 6, 1953, and Volume 7, 1955.

Roster of Kansas Physicians. June 1953 (also monthly supplements).

Medical Health and Related Facilities of Greater Kansas City. Ten County Edition 1954-55. Compiled by the Jackson County Medical Society.

Roster of Wyandotte County Medical Society. 1955.

The Medical Bulletin. Sedgwick County Medical Society. Volume 25, 1955.

Hospital Construction Plan. Kansas State Board of Health. Hospital Facilities Division, July 1, 1955.

This is Part I of a three-part series. Part II will be published in the May issue of the *Journal* and Part III will follow in June.

"Population of Kansas, March 1, 1955, as reported by County Assessors" was used in assigning population figures to various counties and cities. This was issued by the Kansas State Board of Agriculture.

This survey was closed as of October 1, 1955.

Chapter 276, Laws of 1933, regular session of the Kansas legislature, provides for the annual registration of physicians and renewal of all licenses to practice medicine in Kansas. This is required on July 1 of each year. However, the Kansas State Board of Medical Registration and Examination gives physicians until October 1 to comply before they are considered as delinquent. Therefore, October 1, 1955, was selected as the terminal date, and only those physicians who had re-registered on or before that time are included. There are undoubtedly a few physicians in the state who had not renewed their licenses by that date. Thus, it may appear in this study that there are fewer physicians reported in some particular county or city than are actually known to be practicing in that area.

Since Kansas City, Kansas, and Kansas City, Missouri, adjoin each other, many physicians live in Kansas but have their practices in Kansas City, Missouri. The reverse is also true. Many residents in Kansas go to physicians in Kansas City, Missouri. In this study only those physicians who maintain offices in Kansas were considered as Kansas physicians.

Many factors of national, state, and local importance determine the distribution of medical services. On the national level, the Hill-Burton Act has influenced the building of new and additional hospital facilities. Within the state, the Kansas Rural Health Plan has undoubtedly played a part in getting young physicians to locate in small communities. Locally, general social, cultural, economic, and political factors play a part in attracting physicians to a particular community. Perhaps this report will be of assistance in correcting the medical inadequacies of communities where general practitioners are lacking or inadequate in number.

Physicians Licensed in Kansas

The Kansas State Board of Medical Registration and Examination licenses physicians to practice in the state by:

1. *Examination*—Those who pass an examination assembled and administered by the board.
2. *Endorsement*—Those who have been licensed in other states and have met the Board's requirements for reciprocity.
3. *National Boards*—Those who have successfully completed the examination by the National Board of Medical Examiners and are diplomates of that Board.

This paper is concerned only with doctors of medicine in Kansas. No attempt has been made to consider other practitioners of the healing arts.

Table I gives the number of physicians who have been licensed in Kansas each year for the past 20 years. In that period 3,061 have been licensed, or an average of 153 per year. This figure is somewhat misleading since almost all of the graduating seniors of the school of medicine take the examination for licensure, and many of them actually practice elsewhere.

There was a decided increase in the number licensed in 1944. This may have been due to an in-

TABLE I
NUMBER OF PRACTITIONERS LICENSED IN
KANSAS BY YEAR (1935-54 INCLUSIVE)

| <i>Year</i> | <i>Number Licensed</i> |
|-------------|------------------------|
| 1935 | 128 |
| 1936 | 127 |
| 1937 | 105 |
| 1938 | 122 |
| 1939 | 110 |
| 1940 | 111 |
| 1941 | 114 |
| 1942 | 121 |
| 1943 | 109 |
| 1944 | 195 |
| 1945 | 105 |
| 1946 | 232 |
| 1947 | 150 |
| 1948 | 122 |
| 1949 | 185 |
| 1950 | 159 |
| 1951 | 185 |
| 1952 | 180 |
| 1953 | 303 |
| 1954 | 198 |
| Total | 3,061 |

crease in the number of physicians available for licensing because of the accelerated program of teaching medicine during the war years. There has been a gradual increase in the number of licenses issued in the post-war years, especially as the University of Kansas School of Medicine has gradually increased the number of students admitted to and graduated from the school. The unusually large increase in 1953 is difficult to explain. A contributing factor, however, lies in the fact that this was the first year that more than 100 were graduated from the school.

In order to show the trend, by smoothing out year to year fluctuations, a five-year moving average was computed. This is shown in Table II.

Table III shows the number and percentage of physicians licensed in Kansas each year by examination and by endorsement.

We see from Table III that, over the past 20 years, 68 per cent of all physicians licensed in Kansas have been licensed on the basis of examination and only 32 per cent on the basis of reciprocity with other states. The smallest percentage to be licensed by reciprocity was in 1944, during World War II. At that time few physicians were changing locations, espe-

TABLE II

TREND OF LICENSING OF PHYSICIANS IN KANSAS 1935-1954 INCLUSIVE

| <i>Five-Year Period</i> | <i>Mid-Year of Period</i> | <i>Average Number Licenses Per Year Per Period</i> |
|-------------------------|---------------------------|--|
| 1935-39 | 1937 | 118.4 |
| 1936-40 | 1938 | 115 |
| 1937-41 | 1939 | 112.4 |
| 1938-42 | 1940 | 115.6 |
| 1939-43 | 1941 | 113 |
| 1940-44 | 1942 | 130 |
| 1941-45 | 1943 | 128.8 |
| 1942-46 | 1944 | 152.4 |
| 1943-47 | 1945 | 158.2 |
| 1944-48 | 1946 | 160.8 |
| 1945-49 | 1947 | 158.8 |
| 1946-50 | 1948 | 169.6 |
| 1947-51 | 1949 | 160.2 |
| 1948-52 | 1950 | 166.2 |
| 1949-53 | 1951 | 202.4 |
| 1950-54 | 1952 | 205 |

cially from one state to another. One cannot help but be impressed by the low rate of failure among the candidates for licensure by examination over the past 20 years. Many of those taking the examination are recent graduates of the University of Kansas School of Medicine. Some of these do not stay in Kansas but go elsewhere for their internships, residencies, and locations to practice.

It is well known that there are many doctors who are licensed to practice in two or more states, and this of course applies to Kansas. In the tabulations of Table IV only those physicians who are licensed to practice in Kansas and who are now residents of the state are included. The figures do not include those who simply maintain licensure in the state.

Table IV shows that as of October 1, 1955, there were 2,340 doctors of medicine resident and licensed to practice in Kansas. It would appear from this table that about 94 per cent of physicians in Kansas devote their full time to active practice. The services of about 13 per cent of these licensed physicians are available to the public only when admitted to hos-

TABLE III
DISTRIBUTION OF INDIVIDUALS LICENSED IN KANSAS BY YEAR AND BY BASIS OF LICENSING

| <i>Years</i> | <i>Total Licensed</i> | <i>Licensed on Basis of</i> | | <i>EXAMINATION</i> | | <i>ENDORSEMENT</i> | | <i>Number of Failures in the Examination</i> |
|--------------|-----------------------|-----------------------------|----------|--------------------|----------|--------------------|----------|--|
| | | <i>NO.</i> | <i>%</i> | <i>NO.</i> | <i>%</i> | <i>NO.</i> | <i>%</i> | |
| 1935 | 128 | 94 | 74% | 34 | 26% | | | |
| 1936 | 127 | 97 | 76% | 30 | 24% | | | |
| 1937 | 105 | 82 | 78% | 23 | 22% | | | |
| 1938 | 122 | 92 | 75% | 30 | 25% | | | |
| 1939 | 110 | 86 | 78% | 24 | 22% | | | |
| 1940 | 111 | 92 | 83% | 19 | 17% | | | |
| 1941 | 114 | 92 | 81% | 22 | 19% | | | |
| 1942 | 121 | 99 | 82% | 22 | 18% | | | 1 |
| 1943 | 109 | 86 | 79% | 23 | 21% | | | |
| 1944 | 195 | 179 | 92% | 16 | 8% | | | |
| 1945 | 105 | 94 | 90% | 11 | 10% | | | |
| 1946 | 232 | 109 | 47% | 123 | 53% | | | |
| 1947 | 150 | 86 | 57% | 64 | 43% | | | |
| 1948 | 122 | 67 | 55% | 55 | 45% | | | |
| 1949 | 185 | 99 | 54% | 86 | 45% | | | |
| 1950 | 159 | 96 | 63% | 63 | 37% | | | |
| 1951 | 185 | 92 | 49% | 93 | 51% | | | |
| 1952 | 180 | 93 | 52% | 87 | 48% | | | 4 |
| 1953 | 303 | 217 | 72% | 86 | 28% | | | 1 |
| 1954 | 198 | 122 | 62% | 76 | 38% | | | |
| Total | 3,061 | 2,074 | 68% | 987 | 32% | | | 6 |

pitals having interns and resident physicians. The services of 6 per cent of our physicians are not available because they have either retired or are temporarily out of the state in military service. Included in those listed as being in active practice are a few physicians who are not providing direct patient care

TABLE IV

DOCTORS OF MEDICINE LICENSED TO PRACTICE IN KANSAS, OCTOBER 1, 1955

| <i>Status of Practice</i> | <i>Number</i> | <i>Per Cent</i> |
|---|---------------|-----------------|
| Active Practice | 1,899 | 81.15 |
| Interns and Residents (in Kansas) | 299 | 12.78 |
| Absent—In Military Service | 76 | 3.25 |
| Retired | 66 | 2.82 |
| Total | 2,340 | 100.00 |

Note: The above table includes only those physicians licensed to practice in Kansas and who are now residents in the state. The ratio of persons per physician is 876.

but are doing research, teaching, public health work, etc. They are active as doctors of medicine in rendering service of a restricted type as far as actual patient care is concerned.

Table V gives the calculation of age distribution of physicians in Kansas.

TABLE V
DISTRIBUTION BY AGE GROUP—DOCTORS OF
MEDICINE IN KANSAS, OCTOBER 1, 1955

| <i>Age Groups—Years</i> | <i>Number</i> | <i>Per Cent</i> |
|-------------------------|---------------|-----------------|
| Under 30 | 239 | 10.21 |
| 30-39 | 763 | 32.61 |
| 40-49 | 478 | 20.43 |
| 50-59 | 298 | 12.73 |
| 60-69 | 220 | 9.40 |
| 70-79 | 248 | 10.60 |
| 80 and over | 94 | 4.02 |
| Total | 2,340 | 100.00 |

Mean Age—47 years

The number of physicians under 30 years of age in Table V is disproportionately high since it includes those young physicians who are serving as interns or residents in Kansas hospitals. Otherwise, as would be expected, the group under 30 years who are in actual practice would be relatively small. Of the entire group 65.77 per cent are between 30 and 59 years of age, the period considered to be the most effective in the individual's practice. Twenty-four per cent of the physicians are 60 years of age or older. There are 66 physicians in Kansas known to be retired, and they are included in this older age group. The mean or average age for all physicians in Kansas is 47 years. This figure was obtained by adding the ages of all the physicians and dividing by the number of physicians. The following table demonstrates the relationship between the age of physicians and the size of the communities in which they practice (Table VI).

It is interesting to note that there are five large cities (over 30,000 population) in the state and that 505,334 persons, or 24.6 per cent of the state's total population, live therein. Thirty-five communities of intermediate size (between 5,000 and 30,000 population), contain 401,560 persons, or 19.5 per cent of the state's population. Five hundred sixty-nine small communities (less than 5,000 population) claim 446,680 persons as residents or 21.7 per cent of the population of the state. Thus, 65.8 per cent of the state's population resides in communities of varying sizes while 34.2 per cent are farm inhabitants.

TABLE VI
DISTRIBUTION OF DOCTORS BY AGE AND
SIZE OF COMMUNITY

| <i>Size of Com- munity</i> | <i>Age in Years</i> | | | |
|--------------------------------|---------------------|----------|-----------|-----------------|
| | 39 & UNDER | 40 TO 54 | 60 & OVER | <i>All Ages</i> |
| Large* | 609 | 354 | 193 | 1156 |
| Intermediate** | 234 | 300 | 193 | 727 |
| Small*** | 160 | 122 | 175 | 457 |
| Total | 1,003 | 776 | 561 | 2,340 |

* Over 30,000 population

** Between 5,000 and 30,000 population

*** Less than 5,000 population

In the age group 39 years of age and under, the great number of physicians living in the large communities (609 physicians) is weighted by the fact that 299 are interns and residents in hospitals and must take their service in hospitals located in large communities. Otherwise, there is not much difference in the numbers of physicians practicing in the large and intermediate cities. There is not too much difference in the number of men in the three age groups who are practicing in small communities. It would appear that in Kansas physicians in the older age range are not the ones who are giving the greater share of medical service. In the small community the number of young physicians almost equals the number of those 60 and over, which would make it appear that perhaps the Kansas Rural Health Plan is guiding young men into the small communities to practice.

Kansas has three principal cities, Kansas City, Topeka, and Wichita. In order to determine whether these cities receive medical service from physicians of a younger age than does the remainder of the

TABLE VII
AGE DISTRIBUTION OF PHYSICIANS BY
PRINCIPAL CITIES

| <i>Age Group in Years</i> | <i>Principal Cities</i> | | | <i>Remainder of State</i> | <i>Total</i> |
|-----------------------------------|-------------------------|--------|---------|-----------------------------------|--------------|
| | KANSAS CITY | TOPEKA | WICHITA | | |
| Under 30 | 78 | 55 | 56 | 50 | 239 |
| 30-39 | 135 | 108 | 144 | 376 | 763 |
| 40-49 | 66 | 74 | 84 | 254 | 478 |
| 50-59 | 35 | 24 | 41 | 198 | 298 |
| 60-69 | 24 | 19 | 31 | 146 | 220 |
| 70-79 | 10 | 19 | 27 | 192 | 248 |
| 80 & over | 9 | 13 | 8 | 64 | 94 |
| Total | 357 | 312 | 391 | 1,280 | 2,340 |

state, the data were broken down and analyzed as to the age of physicians practicing in the three cities, with physicians practicing in all other parts of the state being pooled into a fourth group. Table VII shows the results of analysis on this basis. Kansas City has more young men under 30 years of age than do the other two cities. This is probably accounted for by the young men in internship and residency training at the University of Kansas Medical Center. There are more physicians in the age group of 30 to 39 years in Wichita than in any of the other cities.

To lessen the influence of the presence of interns and residents on age distribution, let us compare the principal cities as to the proportion of physicians who are 30 to 59 years of age to physicians of all ages. Of Kansas City's physicians, 66 per cent are in the 30 to 59 age group; Topeka, 66 per cent; Wichita, 68 per cent; the remainder of the state has 64 per cent. Thus it would appear that there is no significant difference among the three principal cities or between these cities and the remainder of the state.

Kansas Graduates in Practice in the State

Since the University of Kansas School of Medicine has a great interest in the training of general practitioners of medicine, an attempt was made to assess what the contribution of the school has actually been to the ranks of physicians practicing in the state.

In the 1862 act of the Kansas Legislature establishing the University of Kansas, the founding of the school of medicine was contemplated. It was impossible to carry out the plans at that time, but in 1880 a preparatory medical course was established under the administration of the university.

In the fall of 1905, the Kansas City Medical College (founded in 1869 in Kansas City, Missouri), the Medico-Chirurgical College (founded in 1896 in Kansas City, Missouri), and the College of Physicians and Surgeons (founded in 1893 in Kansas City, Kansas) were merged into the last two years of a four-year medical course under the direction of the University of Kansas. In 1913 the Kansas Medical College of Topeka was merged with the School of Medicine.

The 2,340 physicians in Kansas, as of October 1, 1955, were divided, for purposes of analysis, into three groups:

1. Those who received their M.D. degrees from the University of Kansas School of Medicine.

2. Those who received their M.D. degrees from other schools in Kansas which are no longer in existence.

3. Those who received their M.D. degrees from schools outside Kansas.

From Table VIII we see that of the physicians now in Kansas, only 2.39 per cent graduated from

TABLE VIII
MEDICAL SCHOOL OF GRADUATION,
PHYSICIANS IN KANSAS, 1955

| <i>School</i> | <i>Number</i> | <i>Per Cent</i> |
|----------------------------|---------------|-----------------|
| University of Kansas | 957 | 40.90 |
| Other Kansas Schools | 56 | 2.39 |
| Out-of-State Schools | 1327 | 56.71 |
| Total | 2,340 | 100.00 |

Kansas schools other than the University of Kansas. This is to be expected, since one Kansas school merged with the University in 1905 and the other merged in 1913. Only a few physicians in the older age bracket, who graduated from other Kansas schools, remain in the state. It is readily apparent that there are more physicians in Kansas today who graduated from out-of-state schools than there are physicians who graduated from the University of Kansas (56.71 per cent as compared with 40.90 per cent).

TABLE IX
DISTRIBUTION OF PHYSICIANS BY SCHOOL
OF GRADUATION AND STATUS OF ACTIVITY
OF PRACTICE

| <i>Activity of Practice</i> | <i>K.U.</i> | | <i>Other Kansas Schools</i> | | <i>Out of State Schools</i> | | <i>Total</i> |
|---------------------------------|-------------|----------|---------------------------------|----------|---------------------------------|----------|--------------|
| | <i>NO.</i> | <i>%</i> | <i>NO.</i> | <i>%</i> | <i>NO.</i> | <i>%</i> | |
| Retired | 4 | 0.4 | 7 | 12.5 | 55 | 4.2 | 66 |
| Military Service | 54 | 5.6 | 0 | 0 | 22 | 1.6 | 76 |
| Active Practice | 899 | 94.0 | 49 | 87.5 | 1,250 | 94.2 | 2,198 |
| Total | 957 | 100 | 56 | 100 | 1,327 | 100 | 2,340 |

Table IX shows that, regardless of school of graduation, physicians in Kansas are predominantly active. Two-thirds of the Kansas physicians in military service are graduates of the University of Kansas. On the other hand, the majority of doctors who are now retired came into the state from other schools. This is probably related to the relatively recent development of large graduating classes at the University of Kansas.

Let us next give consideration to the age distribution of the three groups of physicians in Kansas.

TABLE X
DISTRIBUTION OF PHYSICIANS BY SCHOOL OF GRADUATION AND BY AGE

| Age in Years | K.U. | | Physicians OTHER KANSAS SCHOOLS | | OUT OF STATE SCHOOLS | | Total | |
|--------------|------|--------|---------------------------------------|--------|-------------------------|--------|-------|--------|
| | NO. | % | NO. | % | NO. | % | NO. | % |
| Under 30 | 106 | 11.08 | 0 | 0 | 133 | 10.02 | 239 | 10.21 |
| 30-39 | 420 | 43.89 | 0 | 0 | 343 | 25.85 | 763 | 32.61 |
| 40-49 | 232 | 24.24 | 0 | 0 | 246 | 18.54 | 478 | 20.43 |
| 50-59 | 119 | 12.43 | 0 | 0 | 179 | 13.49 | 298 | 12.73 |
| 60-69 | 59 | 6.17 | 11 | 19.64 | 150 | 11.30 | 220 | 9.40 |
| 70-79 | 19 | 1.98 | 33 | 58.93 | 196 | 14.77 | 248 | 10.60 |
| 80 and over | 2 | 0.21 | 12 | 21.43 | 80 | 6.03 | 94 | 4.02 |
| Total | 957 | 100.00 | 56 | 100.00 | 1,327 | 100.00 | 2,340 | 100.00 |

In Table X we see that in actual numbers there is little difference between physicians under 50 years of age who graduated from Kansas University and those who graduated from out of state schools. However, 79 per cent of Kansas University graduates are now under 50 years of age, while only 54 per cent of out-of-state graduates are in that age group. Perhaps this difference in age groups is again due to the fact that the University of Kansas School of Medicine is a relatively young school as compared with other schools of the United States, and also because more of its recent graduates are staying in the state.

Table XI shows that 44.72 per cent of Kansas University graduates have gone to large cities to practice, and 33.65 per cent to cities of 5,000 to 30,000 population. A higher percentage of doctors graduating from out of state go to large communities than of those graduating from the University of Kansas School of Medicine.

The data presented in Table XI are presented in another form in Table XII. Of all doctors located in the large communities of Kansas, 37.03 per cent are graduates of the University of Kansas, while 60.90 per cent are graduates of out-of-state schools. In the small communities we see that 45.30 per cent of the

TABLE XII
PER CENT DISTRIBUTION BY SIZE OF COMMUNITY OF EACH GROUP OF PHYSICIANS BY SCHOOL OF GRADUATION

| School | Size of Community | | | |
|----------------------|-------------------|---------------|-------|-------|
| | LARGE | INTER-MEDIATE | SMALL | TOTAL |
| University of Kansas | 37.03 | 44.29 | 45.30 | 40.90 |
| Other Kansas Schools | 2.07 | 1.93 | 3.94 | 2.39 |
| Out-of-State Schools | 60.90 | 53.78 | 50.76 | 56.71 |
| Total | 100 | 100 | 100 | 100 |

physicians came from Kansas University, while 50.76 per cent came from out-of-state medical schools.

Table XIII would indicate that Kansas has been acquiring physicians, through the process of licensing, at an increasing rate since just prior to World War II. This increase is even greater since the beginning of the Kansas Rural Health Plan instituted by Dr. Franklin D. Murphy. The rate of acquisition is not equal in all parts of the state. In the pre-war years, those areas with a ratio of 1,000

TABLE XI
DISTRIBUTION OF PHYSICIANS BY SCHOOL OF GRADUATION AND BY SIZE OF COMMUNITY

| Size of Community | K. U. | | Other Kansas Schools | | Out of State Schools | | Total | |
|-------------------|-------|-------|----------------------|-------|----------------------|-------|-------|-------|
| | NO. | % | NO. | % | NO. | % | NO. | % |
| Large | 428 | 44.72 | 24 | 42.86 | 704 | 53.05 | 1,156 | 49.40 |
| Intermediate | 322 | 33.65 | 14 | 25 | 391 | 29.47 | 727 | 31.07 |
| Small | 207 | 21.63 | 18 | 32.14 | 232 | 17.48 | 457 | 19.53 |
| Total | 957 | 100 | 56 | 100 | 1,327 | 100 | 2,340 | 100 |

TABLE XIII

LOCATION OF RECENTLY LICENSED PHYSICIANS BY DENSITY OF PHYSICIANS' SERVICES

| Persons Per Physician | Per Cent of State's Population in Area | Acquisition of Recently Licensed Physicians (By Period of Initial Licensing) | | | | | | | |
|-----------------------|--|---|-------|-----------------------|-------|------------------------------------|-------|-------|-------|
| | | PRE-WAR (1936-41) | | POST-WAR (1942-47) | | POST RURAL PROGRAM (1948-55) | | TOTAL | |
| | | NO. | % | NO. | % | NO. | % | NO. | % |
| 1,000 and over | 49.2 | 79 | 34.05 | 103 | 27.76 | 179 | 25.90 | 361 | 27.90 |
| 600-999 | 34.7 | 93 | 40.09 | 161 | 43.40 | 263 | 38.06 | 517 | 39.95 |
| Under 600 | 16.1 | 60 | 25.86 | 107 | 28.84 | 249 | 36.04 | 416 | 32.15 |
| State | 100 | 232 | 100 | 371 | 100 | 691 | 100 | 1,294 | 100 |

or more persons per physician had a greater rate of gain than those areas in which the ratio was under 600 persons per physician. In the post-war years (1942-47) the rate of gain was about the same in these two areas. Since 1948 the rate of gain has been greater in those areas where the ratio of population to physicians is under 600 persons per physician.

Let us break the above figures down and determine the number and percentage of graduates of Kansas University, as compared with graduates from out-of-state schools, who have located in the three types of communities in the three periods of licensing.

Table XIV shows there has been an increasing number and percentage of graduates of Kansas University locating in areas where the ratio of persons per physician is 1,000 or over (supposedly the rural areas) since the pre-war years and continuing to the present. This increase has been most noticeable since 1948 when the rural health program had its inception. However, this is also true of those physicians who graduated from out-of-state schools. In fact, a higher percentage of these physicians than of Kansas

University graduates have located in such areas between 1948 and 1955. This would indicate that the Kansas Rural Health Plan has also served to draw young men into the state.

Summary

A study was made of the distribution of physicians in Kansas as of October 1, 1955. One of the principal reasons for the study was to guide physicians into the practice of medicine in those areas of the state in greatest need of physicians' services.

The study has demonstrated a wide range of variation of distribution of physicians within the state. Differences of age distribution of physicians practicing in Kansas do not appear to be great enough to constitute a serious problem. The majority of physicians are in the age period considered as being the most effective in an individual's practice. Only about one-fourth of the physicians in Kansas are 60 years of age or over, and the average age is 47 years.

The rate of acquisition of newly licensed phy-

(Continued on Page 284)

TABLE XIV

LOCATION OF RECENTLY LICENSED KANSAS UNIVERSITY GRADUATES COMPARED WITH OUT OF STATE GRADUATES BY DENSITY OF PHYSICIANS' SERVICES

| Period of Licensing | Kansas University Graduates PERSONS PER PHYSICIAN | | | | | | Out-of-State Graduates PERSONS PER PHYSICIAN | | | | | | Total | |
|------------------------------------|--|------|---------|------|-----------|------|---|------|---------|------|-----------|------|-------|------|
| | 1000 & OVER | | 600-999 | | UNDER 600 | | 1000 & OVER | | 600-999 | | UNDER 600 | | NO. | % |
| | NO. | % | NO. | % | NO. | % | NO. | % | NO. | % | NO. | % | | |
| Pre-War (1936-41) | 51 | 22.3 | 56 | 19.8 | 43 | 20.4 | 28 | 21.2 | 37 | 15.8 | 17 | 8.3 | 232 | 17.9 |
| Post-War (1942-47) | 70 | 30.6 | 90 | 31.8 | 69 | 32.7 | 33 | 25.0 | 71 | 30.3 | 38 | 18.5 | 371 | 28.7 |
| Post-Rural Program (1948-55) | 108 | 47.1 | 137 | 48.4 | 99 | 46.9 | 71 | 53.8 | 126 | 53.9 | 150 | 73.2 | 691 | 53.4 |
| Total | 229 | 100 | 283 | 100 | 211 | 100 | 132 | 100 | 234 | 100 | 205 | 100 | 1,294 | 100 |

Carcinoma of Thyroid

Analysis of 20 Cases of Tumor of the Thyroid Gland following the Classification of Crile

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Purpose of Paper

Despite an increased knowledge of carcinoma of the thyroid in the past two decades, there remains a remarkable lack of interest regarding nodules and enlargements in the thyroid gland. This analysis of 25 consecutive carcinomas of the thyroid gland treated in Kansas City hospitals* is to emphasize a clinicopathologic classification based on the material, and to indicate definite trends in prognosis and therapy of cancer of the thyroid gland. It is important to realize that the high incidence of benign tumors of the thyroid, their similarity to low grade malignant tumors, and the differences of opinion among pathologists in differentiating adenomas from carcinomas have caused confusion in the minds of those who encounter cancer of the thyroid.

The term "cancer" usually implies a highly malignant tumor which causes death within five years. Cancer of the thyroid, however, may pursue an unusually benign course over 20 years or more. Since it is frequently difficult to separate benign from malignant tumors, and since many malignant tumors of the thyroid are slow growing, such terms as "lateral aberrant thyroid" and "benign metastasizing goiter" have been used to designate low grade carcinomas in which a primary tumor of the thyroid is not recognized.¹ Such tumors are metastasizing carcinomas and may cause death if improperly treated.

In 1948 a classification of carcinoma of the thyroid was developed which accurately correlated the histological and clinical characteristics of the disease (See Table I). This classification divided carcinoma of the thyroid into two general groups, the papillary type and the non-papillary type. Papillary carcinomas were described as lymphangio-invasive tumors that metastasized to lymph nodes. Non-papillary carcinomas were found to be hemangio-invasive and metastasized through the blood stream.

Variations in clinical behavior and prognosis of these two groups were best explained by their method of metastasis. Papillary carcinomas had a favorable prognosis; unless extensive metastasis had occurred, cure was obtained by removal of the primary tumor

and the local metastatic growths. When non-papillary tumors metastasized, the prognosis was usually hopeless.

Non-papillary carcinomas were subdivided into undifferentiated carcinoma, angio-invasive adenoma, and adenocarcinoma. These types occurred in an older age group, metastasized distantly, and had a grave prognosis. Certain non-papillary carcinomas possess histological staining properties of an oxyphilic nature

Behavior and prognosis of carcinoma of the thyroid are explained by the histological type of tumor and its method of metastasis. Papillary carcinoma is lymphangio-invasive, metastasizes locally, and offers a favorable prognosis. Non-papillary carcinoma metastasizes through the blood stream to distant sites and is frequently beyond cure when first seen. Conventional x-ray therapy has been disappointing.

and are termed Hürthle cell tumors. Their clinical behavior is indicated by the type of neoplasm which they have formed and not by the staining property of their cells. Hürthle cell carcinomas occur most commonly as encapsulated angio-invasive carcinomas and adenocarcinomas.

The third group of carcinomas of the thyroid included squamous cell carcinoma, metastatic carcinoma, and an unusual lesion, the non-encapsulated sclerosing tumor or sclerosing micro-carcinoma. The latter tumor rarely exceeded two centimeters in diameter and usually represented an incidental finding during thyroidectomy for other reasons.³

The final group of malignancies of the thyroid was of mesenchymal origin and included lymphosarcoma, reticulum cell sarcoma, Hodgkin's sarcoma, Hodgkin's granuloma, plasmocytoma, fibrosarcoma, and osteogenic sarcoma.

Presentation of Material

In analyzing the 25 collected cases of malignancy of the thyroid, it was necessary to discard five cases.

* Cases are from records of Bethany Hospital, St. Margaret's Hospital and Providence Hospital, Kansas City, Kansas.

In four of these cases, biopsies were performed but pathological slides and records were missing. The fifth patient died of widespread metastasis without confirmation by biopsy. Twenty cases remained available for analysis.

In considering the entire group, age at onset of tumor varied from five years to 58 years, with an average age of onset of 36.2 years. Nine of the 20 patients were under 35 years of age prior to operation. The interval from the time of onset to the time of treatment ranged from six weeks to 40 years and averaged 8.5 years.

Fourteen of the patients were women, six were men. There were 18 Caucasians, one Negro, and one Mexican.

The initial complaint of 19 patients was a mass in the neck. The growths were noted on the right in 13 cases, on the left in two cases, and were bilateral in one case. The location was not recorded in three cases. Dyspnea was an associated complaint in six patients, hoarseness in three, and cough in two.

Operations were performed on 18 patients. Removal of a unilateral lobe was accomplished in 11 patients, total thyroidectomy with radical neck dissection in three, and biopsy of the cervical lymph nodes in two. Postoperative complications appeared twice in this group.

One patient developed a transitory auricular fibrillation. Another patient died 24 hours postoperatively, which represented a surgical mortality rate of 5.5 per cent. The death occurred following a rapidly rising temperature, tachycardia, and cyanosis that persisted after tracheotomy.

Seven patients were treated prophylactically with x-ray irradiation, and no definite therapeutic conclusions can be drawn. Non-papillary tumors were ob-

livious in their growth rates to conventional x-ray therapy, and, in general, papillary tumors were resistant to irradiation. Sensitivity of papillary tumors has been assumed to be due to the fact that roentgen treatment retarded the growth of nodules that often required as long as 20 years to become visible in the neck. When untreated papillary tumors required this length of time to enlarge, it seems difficult to estimate the effects of irradiation on their growth rate.

Papillary Carcinoma

Of the 20 patients studied, papillary tumors were present in 11 and non-papillary tumors were found in nine. To compare these patients from a clinicopathologic standpoint, the two groups were studied in accordance with their pathological classifications.

In the papillary group, the age of the patient at the time of onset of tumor ranged from five to 55 years, averaging 29.9 years. Six of the patients were women and five were men. There were ten Caucasians and one Mexican. The period of time between onset and treatment varied from two months to eight years and averaged 2.6 years. Four patients had cervical lymph node biopsies prior to surgery, and the diagnosis of papillary carcinoma was made in three instances. In one case a normal lymph node was found. Subtotal thyroidectomies had been performed previously in two patients. A second operation became necessary in one patient after eight years and in the other patient after 28 years.

Roentgen therapy was used in two patients. In one case, treatment had been given eight years prior to recurrence. In the other case, irradiation therapy was employed as a prophylactic measure postoperatively.

It has been possible to follow all eleven patients in this group. Follow-up periods from the time of operation range from three months to 16 years and average 5.1 years. Eight patients are alive and well. Of these, a simple lobectomy of the tumor-containing lobe was the method of treatment in seven cases. The other patient had a total thyroidectomy, unilateral radical neck dissection, and excision of the cervical lymph node chain on the remaining side. One patient who is alive with disease had a total thyroidectomy with radical neck and mediastinal lymph node dissection. One patient died postoperatively and one died following an operation not related to the thyroid.

Non-papillary Carcinoma

Of the nine patients with non-papillary carcinoma, the age at the time of onset of the tumor ranged from 30 to 70 years and averaged 52.7 years. Eight of the patients were women and one was a man. There were eight Caucasians and one Negro. In four patients there had been stationary enlargement of the thyroid for many years before sudden, rapid growth occurred. Five patients noted abrupt onset of a mass in the neck.

TABLE I
CLASSIFICATION OF MALIGNANT TUMORS OF
THE THYROID²

CARCINOMA:

1. Papillary carcinoma
2. Non-papillary carcinoma
 - a. Angio-invasive adenoma
 - b. Adenocarcinoma
 - c. Undifferentiated carcinoma
3. Special types
 - a. Non-encapsulated sclerosing tumor
 - b. Squamous cell carcinoma
 - c. Metastatic carcinoma

SARCOMA:

1. Lymphosarcoma
2. Reticulum cell sarcoma
3. Hodgkin's sarcoma
4. Fibrosarcoma
5. Osteogenic sarcoma

within the period of a year, and in one instance the sudden enlargement occurred six weeks before surgery. Two patients had a history of prior surgical procedures. One operation consisted of a biopsy of a cervical lymph node one year previously. The other consisted of a sub-total thyroidectomy 20 years before.

Surgical procedures were primarily palliative in this group. An operation for possible cure was performed in only two patients. One patient died 16 months later, and the other has been followed with disease for six years. The remaining patients were considered inoperable when first examined.

Four patients were treated with roentgen irradiation. The therapy in two cases was given in the immediate postoperative period, and both died within three months. The other two patients died within 16 months.

Follow-up records are available for seven of the nine patients. Five are dead, and four of these were dead within six months following operation. Two patients are alive with disease. Two patients could not be followed, but the clinical records indicate that both were released from the hospital for terminal care. One had a partial obstruction of the trachea and esophagus, and the other exhibited widespread invasion of the structures of the neck and tracheal compression.

Case Histories

Other points regarding carcinoma of the thyroid may be considered in reviewing several of the representative case histories in the series.

Case 1. C. H., a white woman, age 31, was admitted with a firm enlargement in the right lobe of the thyroid of 18 months' duration. A nodule three centimeters in diameter was present in the right lobe, and the entire lobe was removed. The patient is alive and well four years later. Histological examination revealed a papillary carcinoma.

This patient had, presumably, an innocuous enlargement in the neck. The factors aiding in the diagnosis of cancer in such a case are worthy of comment. The pre-operative recognition of carcinoma of the thyroid is not made in from 8 to 60 per cent of the cases.⁴ The low rate of recognition is due to lack of knowledge in differentiating benign and malignant tumors.

Since the incidence of malignancy in discrete nodules of the thyroid approximates 25 per cent,^{5, 6} all such nodules in the thyroid should be removed. Those nodules must be removed under the premise that the nodule is a cancer, and not that the operation will prevent development of a cancer. If the surgeon considers the operation to be prophylactic (to prevent a subsequent malignancy), he not only will fail in accurate pre-operative diagnosis but also will not perform a total lobectomy or a total thyroidectomy as a routine practice. The same pre-operative suspicion

must be levied against nodules in the thyroid as against nodules in the breast.

Although it is known that cancers of the thyroid may be multicentric and involve both lobes and that patients with multi-nodular goiters may develop cancer, papillary carcinoma of the thyroid usually occurs as a solitary nodule confined to one lobe.

The enlargement of a solitary nodule is not a prerequisite for the diagnosis of malignancy. The primary neoplasm may not even be palpable, yet metastasis can occur.

An important criterion in pre-operative diagnosis is that papillary tumors are hard while palpable metastases may impart a soft or cystic sensation. Non-papillary tumors feel rubbery and may be most difficult to differentiate from benign adenoma.

Case 2. H. H., a white woman, age 72, complained of a growth in the neck that had been present for 33 years, more noticeable for two years prior to admission. A lymph node biopsy had been performed at that time, followed by x-ray therapy. A second cervical lymph node biopsy was performed two years later, followed by another course of x-ray therapy. The patient died three months later. At autopsy, a non-papillary carcinoma of the thyroid was found.

This case emphasizes the relationship between cancer and pre-existing goiter. It is not entirely possible to prove or disprove that carcinomas arise in adenomata. Since multi-nodular goiters occur four times more frequently than mono-nodular goiters, the former should more commonly become malignant. Since this is not the case, it is logical to assume that most cancers are low grade malignancies at their onset. It is rare to find any trace of benign adenoma in a mass of carcinoma, and one does not see areas of cancer in a benign adenoma.

Case 3. B. B., a white woman, age 55, was admitted with a nodular enlargement of the right lobe of the thyroid, cough, and weakness of six weeks' duration. She denied previous knowledge of the growth in the neck. A right lobectomy was easily accomplished, and a non-papillary tumor was found. Postoperative x-ray therapy was instituted. The patient died 16 months later.

Case 4. B. M., a white woman, age 46, complained of a swelling in the neck (which extended from the mandible to the clavicle), dyspnea, cough, and hoarseness of three months' duration. A biopsy was taken and a tracheotomy performed. Post-operative x-ray therapy was instituted and was continued until death three months later due to tracheoesophageal fistula. The neoplasm was a non-papillary tumor.

Patients with diffuse non-papillary carcinoma of the thyroid are not cured by thyroidectomy or radical neck dissection, and the malignancy is not controlled by x-ray therapy. Such cases are usually incurable when first seen.

Case 5. D. L., a white man, age 26, was rejected for life insurance four months prior to admission because of a mass in the neck. Biopsy of an axillary lymph node three weeks before was not abnormal histologically. At operation the right lobe of the thyroid contained a tumor one centimeter in diameter. The left lobe was completely replaced by grayish-white tumor tissue. There was metastasis in the right superior-mediastinum. A total thyroidectomy with limited neck and mediastinal dissection was performed. The pathological diagnosis was papillary carcinoma. The patient is alive with disease 20 months later.

Papillary carcinoma metastasizes via lymph vessels within the thyroid substance. It spreads to the retro-thyroid lymph nodes, the midline Delphian lymph node described by Cope,⁷ to the cervical and mediastinal lymphatic chains, and to the contra-lateral thyroid lobe. It is not possible to accomplish en bloc dissections of the primary tumor and its zones of metastasis, and it is unusual for papillary carcinoma to involve the sternocleidomastoid muscle. Conventional radical neck dissections are advantageous, then, only in selected cases of recurrent carcinoma implanted through the neck after an incomplete primary operation. Many papillary tumors occur in young, unmarried women. The resultant cosmetic aspects of radical neck dissection seem unnecessary if one is aware that the reported results of conservative operations for cervical lymph node metastasis are equally as effective.⁸

In papillary cancer of the thyroid the important factor in proper treatment is complete removal of the thyroid tumor. Such removal demands resection of the involved lobe and isthmus, and frequently the contra-lateral lobe. Contralateral lobe metastasis may occur more commonly than is suspected. The lateral cervical lymph node metastasis from a completely removed primary tumor may be managed by limited neck dissections in which the cervical lymph nodes are removed alone or in conjunction with the jugular vein. If removal of the primary tumor is incomplete, it will recur and continue to metastasize.

Case 6. L. R., a white man, age 44, was found to have a nodule 1.5 centimeters in diameter in the left lobe of the thyroid during a pre-employment physical examination. He was unaware of the growth. At first he refused operation but two months later decided to undergo surgery. A firm nodule was present in the lower pole on the anterior surface of the left lobe. The lobe was removed. A small papillary carcinoma was found. The patient is alive and well 10 months later.

This patient again emphasizes the importance of routine lobectomy for solitary nodules. The tumor was small. The surgical procedure consisted of a cancer operation despite the rather harmless appearance of the tumor when exposed.

Although this tumor had an anterior location in the thyroid, the posterior aspect of the lobe is the more common site for papillary carcinoma. Since the conventional thyroidectomy removes only the anterior portion of the lobe, it is not unusual for local recurrences to follow this procedure when the lesions are posteriorly located.

The limiting factor in performing a complete lobectomy is fear of damage to the recurrent laryngeal nerve. If the nerve is identified, the entire lobe can be removed with resultant nerve injury in only 0.5 per cent of cases. If the nerve is not identified and an adequate lobectomy performed, the nerve injury rate in reported series increases to 5 per cent.⁹

Case 7. D. K., a white woman, age 70, stated she had had a tumor in her neck for 40 years. There was no appreciable change in size. Exploratory laparotomy for a mass in the upper abdomen revealed metastatic carcinoma in the liver. At autopsy, eight months later, a primary non-papillary carcinoma of the thyroid was present.

Might the patient's chance for survival have been higher had a thyroidectomy been performed as soon as this tumor was observed? In this case the answer appears obvious; yet, in the series, the non-papillary tumor, even when removed at the earliest opportunity, killed its host within a few months.

In moderately malignant non-papillary tumors, that is, angio-invasive adenomas and adenocarcinomas, early adequate operations will perhaps increase the rate of cure. The delay factor is not as important in prognosis of carcinoma of the thyroid as is the type of cancer and the type of operation for its removal.

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98th Annual Session, Kansas Medical Society

*Sunday, May 5, through Thursday,
May 9, Wichita, Kansas*

GUEST SPEAKERS



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Specialty: Surgery.



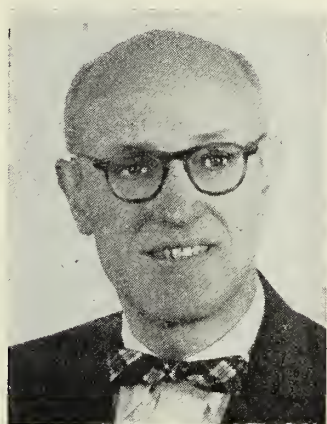
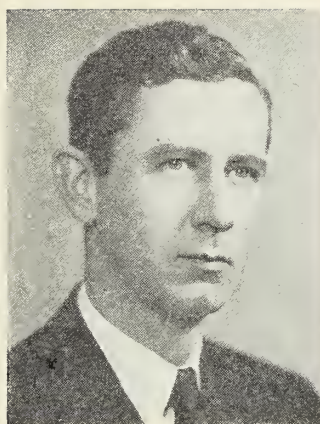
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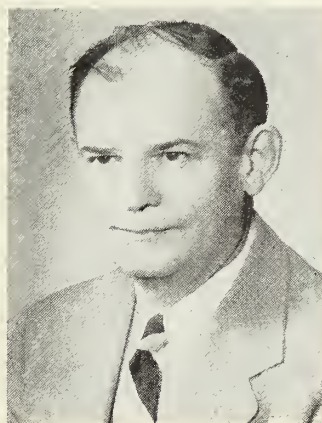
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PAUL H. LORHAN, M.D.

Kansas City, Kansas

Graduate, Creighton University School of Medicine, 1935; Professor of Anesthesiology, University of Kansas Medical Center; Diplomate, American Board of Anesthesiology; Fellow, American College of Anesthesiology and International College of Anesthesiology; Member, Academy of Anesthesiology.

Specialty: Anesthesiology.



Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015



VINCENT P. MAHONEY, M.D.

Camden, New Jersey

Graduate, University of Pittsburgh School of Medicine, 1938; Associate in Psychiatry, Jefferson Medical School; Former Associate in Neurology and Psychiatry, Graduate School of Medicine, University of Pennsylvania; Attending Psychiatrist, Our Lady of Lourdes Hospital, Camden; Diplomate, American Board of Psychiatry and Neurology; Member, American Psychosomatic Society, American Psychiatric Society, Philadelphia Psychoanalytic Society.

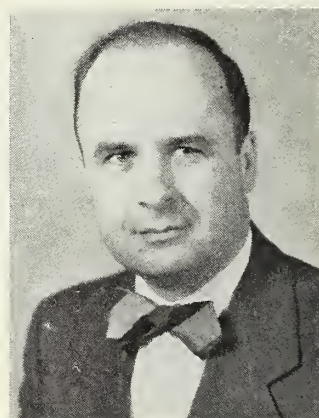
Specialty: Psychiatry.

THOMAS F. MORROW, M.D.

Wichita, Kansas

Graduate, Marquette University School of Medicine, Milwaukee, 1946; Internship at Milwaukee County Hospital; Residency, Friends Hospital, Philadelphia; Diplomate, American Board of Psychiatry and Neurology; Member, American Psychiatric Association.

Specialty: Psychiatry and Neurology.

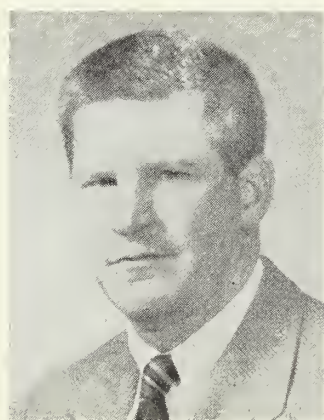


TRUMAN G. SCHNABEL, JR., M.D.

Philadelphia, Pennsylvania

Graduate, University of Pennsylvania School of Medicine, 1943; Assistant Professor of Medicine, University of Pennsylvania School of Medicine, 1954; Markle Scholar in Medical Science; Diplomate, American Board of Internal Medicine, Member, American College of Physicians, American Clinical and Climatological Association.

Specialty: Cardiovascular Disease.



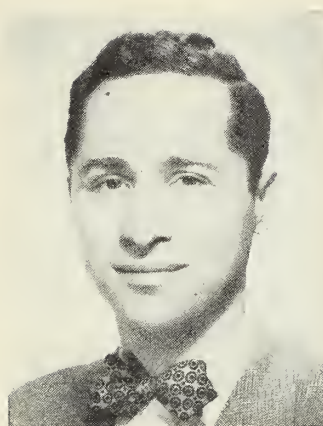
Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

FRED N. SILVERMAN, M.D.

Cincinnati, Ohio

Graduate, State University of New York College of Medicine, 1939; Associate Professor of Pediatrics and of Radiology, College of Medicine, University of Cincinnati; Director, Division of Roentgenology, Children's Hospital, Cincinnati; Attending Pediatrician, Children's Hospital and Cincinnati General Hospital; Associate in Physical Growth, Fels Research Institute; Diplomate, American Board of Pediatrics; Member, American Academy of Pediatrics.

Specialty: Pediatrics.



AUSTIN E. SMITH, M.D.

Chicago, Illinois



Graduate, Queen's University Faculty of Medicine, Kingston, Ontario, 1938; Editor and Managing Publisher, *Journal of the American Medical Association*; Executive Editor, *The World Medical Journal*; Chairman, Board of Directors, U. S. Committee of World Medical Association; Member, Board of Trustees of United States Pharmacopeia, Division of Medical Sciences of National Research Council, Council of Queen's University, American Medical Writers' Association, Society of Experimental Biology and Medicine, American Therapeutic Society, Canadian Physiological Society.

Specialty: Medical Publishing.

Committees for Annual Session

GENERAL CHAIRMAN—J. H. Holt, M.D.

ARRANGEMENTS—D. Cramer Reed, M.D.

AUXILIARY—A. F. Wittmann, M.D.

ENTERTAINMENT—M. M. Tinterow, M.D.

HOUSING—J. A. Pinsker, M.D.

MEDICAL ASSISTANTS—A. E. Hiebert, M.D.

PROGRAM—William J. Reals, M.D.

PUBLICITY—A. L. Ashmore, M.D.

SCIENTIFIC EXHIBITS—T. J. Luellen, M.D.

TECHNICAL EXHIBITS—J. Robert Weaver, M.D.

Chronological Program

Listing of Events, Sunday, May 5 through Thursday, May 9, 1957

Sunday, May 5

- 9:00 Kansas Medical Assistants' Society. See Page 244
- 11:00 Annual Meeting and Luncheon, Blue Shield Board of Directors
Allis Hotel, Ingalls Room
- 12:00 Kansas Chapter, American Academy of General Practice. See Page 241

Monday, May 6

- 9:00 Kansas Chapter, American Academy of General Practice. See Page 241
- 9:00 Kansas Medical Assistants' Society. See Page 244
- 9:00 Woman's Auxiliary to the Kansas Medical Society. See Page 240
- 10:30 Meeting and Luncheon, Professional Advisory Committee for Vocational Rehabilitation
Allis Hotel
- 11:00 Golf Tournament, Kansas Medical Golfing Association
Crestview Country Club, 4201 East 21st Street
Just East of Wichita University
- 12:00 Skeet Shoot, Kansas Medical Skeet Shooting Association
Ark Valley Gun Club. Go East on Kellogg 64 Blocks to Woodlawn, Then 4 Miles Farther East, Then 1½ Miles South
- 1:00 Closed Circuit Television Program. See Page 235
- 7:00 Sportsmen's Banquet and Awarding of Prizes
Crestview Country Club, 4201 East 21st Street
Just East of Wichita University

Tuesday, May 7

- 7:30 House of Delegates Breakfast and Meeting
Allis Hotel Ballroom
- 9:00 Woman's Auxiliary to the Kansas Medical Society. See Page 240
- 1:00 General Session Registration at Forum. See Page 236
- 4:45 Meetings of Specialty Groups. See Page 239
- 7:00 Dinner and Show Presented by Committee on Allied Groups
Broadview Hotel. See Advertisement on Page 255

Wednesday, May 8

- 8:30 General Session Registration at Forum. See Page 237
- 9:00 Woman's Auxiliary to the Kansas Medical Society. See Page 240
- 12:00 Clinicopathological Conference and Luncheon. See Page 237
Broadview Hotel Ballroom
- 1:00 General Session Registration at Forum. See Page 237
- 7:00 Annual Banquet, Program, Dance
Broadview Hotel Ballroom

Thursday, May 9

- 8:30 General Session Registration at Forum. See Page 238
- 12:00 House of Delegates Luncheon and Meeting
Allis Hotel Ballroom

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

Program of General Session

Monday, May 6, 1957

11:00-2:30 Tee Off Time, Kansas Medical Golf-
ing Association

Crestview Country Club, 4201 East 21st
Street

Just East of Wichita University

12:00 Shooting Time, Kansas Medical Skeet
Shooting Association

Ark Valley Gun Club. Go East on Kellogg
64 Blocks to Woodlawn, Then 4 Miles
Farther East, Then 1¼ Miles South

Afternoon

1:00 Closed Circuit Television Program

Sponsored by Smith, Kline and French
Laboratories

Allis Hotel, Empire Room

**THE PHYSICIAN AND EMOTIONAL DISTURB-
ANCE**

Herbert C. Modlin, M.D., Topeka, *Presiding*

Participants in Chicago:

E. Irving Baumgartner, M.D., Secre-
tary, A.M.A. Section on General Prac-
tice

C. H. Hardin Branch, M.D., Psychia-
trist, University of Utah

C. Knight Aldrich, M.D., Psychiatrist,
University of Chicago

Andrew S. Tomb, M.D., Chairman,
A.A.G.P. Liaison Committee on Men-
tal Health

Evening

7:00 Sportsmen's Banquet and Awarding of
Prizes

Crestview Country Club, 4201 East 21st
Street

Just East of Wichita University

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

Program of General Session

Tuesday, May 7, 1957

Allis Hotel, Wichita Forum, and Broadview Hotel

Morning

7:30 House of Delegates Breakfast and Meeting
Allis Hotel Ballroom

9:00 Registration at Wichita Forum

3:30 Intermission to Visit Exhibits

SECOND SESSION

Russell A. Nelson, M.D., Wichita, *Presiding*

Afternoon

FIRST SESSION

1:15 OPENING REMARKS AND INTRODUCTIONS

Clyde W. Miller, M.D., Wichita
President, Kansas Medical Society

3:45 THE ROLE OF PSYCHIATRY IN THE REHABILITATION OF THE AGED

Thomas F. Morrow, M.D., Wichita

4:15 ANESTHETIC MANAGEMENT OF THE AGED

Paul H. Lorhan, M.D., Kansas City

1:30 THE AMERICAN DOCTOR IN WORLD MEDICINE

Austin E. Smith, M.D., Chicago

4:45 Meetings of Specialty Groups. See Page 239

12:15 Lunch

Evening

2:30 THE COMPETENT INVESTIGATION OF DEATH IN THE PUBLIC INTEREST

Richard Ford, M.D., Boston

7:00 Dinner and Show Presented by Committee on Allied Groups
Broadview Hotel. See advertisement on Page 255

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

Program of General Session

Wednesday, May 8, 1957
Wichita Forum and Broadview Hotel

Morning

8:30 Registration at Wichita Forum

THIRD SESSION

George L. Norris, M.D., Winfield, *Presiding*

9:05 Movie—Embryology and Pathology of the
Intestinal Tract

10:00 ROENTGEN MANIFESTATIONS OF UNRECOGNIZED TRAUMA IN INFANTS

Fred N. Silverman, M.D., Cincinnati

10:30 Intermission to Visit Exhibits

FOURTH SESSION

Horace M. Wiley, M.D., Garden City, *Presiding*

10:50 SURGICAL DISEASES OF THE AORTA AND
GREAT VESSELS

Denton A. Cooley, M.D., Houston

11:25 THE IMPORTANCE OF PHYSIOLOGICAL
STUDIES IN THE EVALUATION OF PATIENTS
WITH RHEUMATIC HEART DISEASE

Truman G. Schnabel, Jr., M.D., Philadelphia

Noon

12:00 Luncheon at Broadview Hotel Ballroom

Clinicopathological Conference

Frank A. Mantz, Jr., M.D., Kansas City
Associate Professor of Pathology
University of Kansas School of Medicine

Afternoon

1:00 Registration at Wichita Forum

FIFTH SESSION

1:45 PANEL DISCUSSION ON CARDIOVASCULAR
DISEASE

Earl L. Mills, M.D., Wichita, *Moderator*

Participants:

Denton A. Cooley, M.D., Houston

Truman G. Schnabel, Jr., M.D., Philadelphia

Fred N. Silverman, M.D., Cincinnati

2:45 Intermission to Visit Exhibits

SIXTH SESSION

3:00 PANEL DISCUSSION OF GASTROINTESTINAL
DISEASE

Mahlon H. Delp, M.D., Kansas City,
Moderator

Participants:

Frank F. Allbritten, Jr., M.D., Kansas
City

Franz J. Ingelfinger, M.D., Boston

Vincent P. Mahoney, M.D., Camden

Evening

7:00 Annual Banquet, Program and Dance
Broadview Hotel Ballroom

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

Program of General Session

Thursday, May 9, 1957
Wichita Forum and Allis Hotel

Morning

EIGHTH SESSION

Lloyd W. Reynolds, M.D., Hays, *Presiding*

8:30 Registration at Wichita Forum

10:50 RECOGNITION AND PRINCIPLES OF THE SUR-
GICAL TREATMENT OF IDIOPATHIC CON-
GENITAL MEGACOLON

Frank F. Allbritten, Jr., M.D., Kansas
City

SEVENTH SESSION

John L. Morgan, M.D., Emporia, *Presiding*

11:25 CHANGING CONCEPTS IN PSYCHOSOMATIC
MEDICINE AND THEIR RELATION TO CLIN-
ICAL PRACTICE

Vincent P. Mahoney, M.D., Camden

9:05 Movie—The Medical Witness

10:00 THE NATURE, DIAGNOSIS AND MANAGEMENT
OF DISORDERS OF THE GASTROESOPHAG-
EAL AREA

Franz J. Ingelfinger, M.D., Boston

Noon and Afternoon

12:00 House of Delegates Luncheon and Meet-
ing

10:30 Intermission to Visit Exhibits

Allis Hotel Ballroom

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

Specialty Society Events

Tuesday, May 7, 1957

FOR ANESTHESIOLOGISTS

4:45 Business Meeting, Kansas Society of Anesthesiology

Allis Hotel, West Room

FOR PATHOLOGISTS

4:45 Business Meeting and Election of Officers, Kansas Society of Pathologists

Sedgwick Country Medical Society Building, 1102 South Hillside

FOR E.E.N.T. SPECIALISTS

5:00 Business Meeting and Cocktail Party

Wichita Club

FOR RADIOLOGISTS

4:45 Business Meeting, Kansas Radiological Society

Place to Be Announced

FOR OBSTETRICIANS

6:30 Banquet and Program, Kansas State Obstetrical Society

Broadview Hotel

FOR UROLOGISTS

6:00 Business Meeting, Adoption of Constitution and By-Laws, Election of Officers, Kansas Urological Society

Office of the President, Dr. H. F. O'Donnell, 425 North Hillside

FOR ORTHOPEDISTS

4:45 Business Session, Kansas Orthopedic Club

Broadview Hotel, Room 108

6:30 Dinner, Kansas Urological Society

Droll's Restaurant, 3120 East Central

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

Woman's Auxiliary to the Kansas Medical Society

May 6, May 7, and May 8, 1957

Monday, May 6

9:00-4:00 Registration, Hotel Lassen Mezzanine

4:00-8:00 Cocktail Hour, Buffet Supper, Program

Petroleum Club, First and Main Streets

Program by Bob Gadberry, "Pals, Pills, Pulse and People"

6:30 Dinner, Program

Innes Tea Room, Main Dining Room

Program by Betty Dickerson, "Figures and Fashion"

Tuesday, May 7

9:00-4:00 Registration, Hotel Lassen Mezzanine and Forum

12:30 Past State Presidents' Luncheon

Innes Tea Room, Club Room

1:15 Opening Session of Kansas Medical Society Meeting

Forum

3:00 Pre-Convention Board of Directors Meeting

Auditorium, Kansas Gas and Electric Building
201 North Market, Across from Lassen

8:45 General Session

Sedgwick County Medical Society Building
1102 South Hillside

Transportation provided

1:00 Luncheon

Hotel Lassen Ballroom

3:00 Post-Convention Board of Directors Meeting

Hotel Lassen, Frontier Room

7:00 Annual Kansas Medical Society Banquet

Hotel Broadview Ballroom

Kansas Chapter, American Academy of General Practice

Sunday, May 5, and Monday, May 6, 1957
Broadview Hotel, Wichita

Sunday, May 5

12:00 Registration in English Room until 6:00

6:30 ANNUAL DINNER, ENGLISH ROOM

Guest Speaker: Fount Richardson, M.D.,
Chairman, Board of Directors, American
Academy of General Practice

Subject: General Practice and the Medical School

8:30 BUSINESS MEETING

Presiding: Conrad M. Barnes, M.D., President,
Kansas Chapter, American Academy of General Practice

8:30 Entertainment for the Ladies

9:40 Speaker: Charles A. Rymer, M.D., Denver

Subject: The General Practitioner as His
Own Psychiatric Consultant

10:20 Intermission

10:30 Speaker: Fount Richardson, M.D., Chairman,
Board of Directors, American Academy of General Practice

Subject: Some Facets of Geriatrics

11:20 ROUNDTABLE DISCUSSION

Presiding: Conrad M. Barnes, M.D., President,
Kansas Chapter, American Academy of General Practice

Monday, May 6

9:00 PROGRAM IN ROSE ROOM ON MEZZANINE

Speaker: Jesse D. Rising, M.D., Kansas City


Subject: Are Doctors Outsmarting Themselves Therapeutically?

Participants:

Fount Richardson, M.D.

Jesse D. Rising, M.D.

Charles A. Rymer, M.D.



a major
advance
in sulfa
therapy

KYNEX* ■ ■ ■ ■ ■
Sulfamethoxypyridazine Lederle

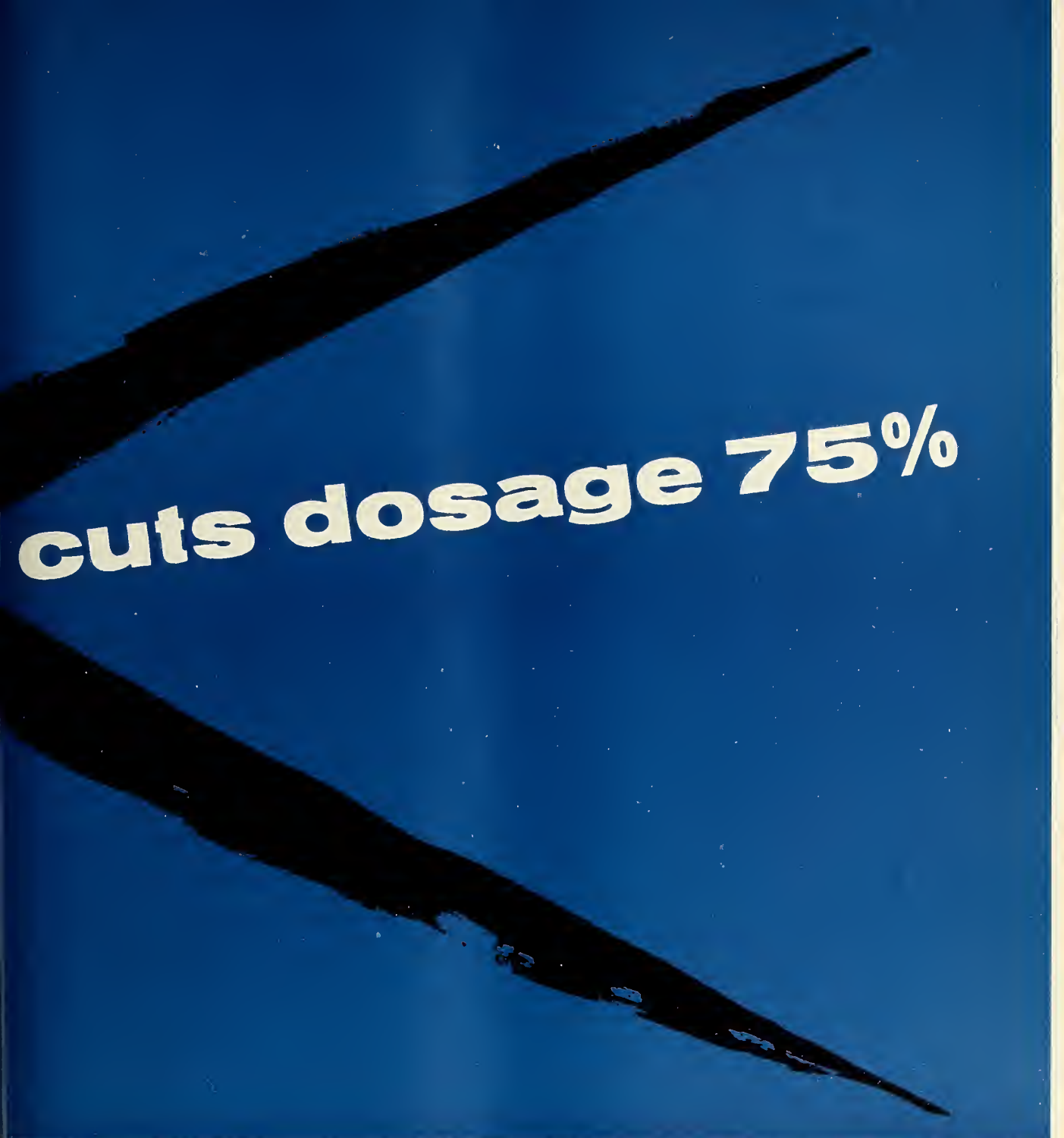
KYNEX is an entirely new, readily soluble, single sulfonamide exhibiting excellent antibacterial action at radically reduced dosage.

KYNEX offers desirable clinical advantages hitherto not obtained by any related drug—

LOW DOSAGE: a total maintenance dose of only 2 tablets daily.

HIGH SOLUBILITY: prompt absorption, adequate diffusion into body fluid and tissue.

PROLONGED ACTION: therapeutic blood levels within the hour, blood concentration peaks within 2 hours—5-10 mg. per cent blood levels persist 24 hours after single oral dose of 1 Gm.



cuts dosage 75%

BROAD-RANGE EFFECTIVENESS: KYNEX is particularly efficient in urinary tract infections due to sulfonamide-sensitive organisms, including *E. coli*, *Aerobacter aerogenes*, *paracolon bacilli*, streptococci, staphylococci, Gram-negative rods, diphtheroids and Gram-positive cocci.

SAFETY: KYNEX offers a margin of clinical safety based on low required dosage, solubility, slow excretion rate. Although KYNEX Sulfamethoxypyridazine is a sulfonamide derivative and the usual precautions regarding such drugs should be observed, the low daily dose of 1.0 Gm. is all that is required for the therapeutic blood levels. No increase in dosage is recommended.

CONVENIENCE: The low dose of 1 Gm. (2 tablets) per day offers optimal convenience and acceptance to patients.

EACH TABLET CONTAINS: sulfamethoxypyridazine . . 0.5 Gm. (7½ grains). **AVAILABLE:** Bottles of 24 and 100 Tablets.

LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, NEW YORK

*Reg. U.S. Pat. Off.



Kansas Medical Assistants' Society

*17th Annual Meeting
May 4, 5, and 6, 1957*

Saturday Evening, May 4

8:00 Style Show and Entertainment
Auditorium, Kansas Gas and Electric
Building
Across Street from Lassen Hotel

Sunday, May 5

All Sessions at Lassen Hotel

9:00 Registration and Coffee

9:00 Executive Board Meeting

12:00 Presidents' Luncheon

1:30 Call to Order

1:35 ADDRESS OF WELCOME
Ernest W. Crow, M.D., Wichita, President,
Sedgwick County Medical Society

1:45 RESPONSE
Clyde W. Miller, M.D., Wichita, President,
Kansas Medical Society

2:00 SOME LEGAL ASPECTS OF THE DOCTOR'S
OFFICE ROUTINE
John Lancelot, Wichita, Attorney

2:30 APPLICATIONS OF PSYCHIATRY
Rodger Moon, M.D., Prairie Village

3:30 Business Session and Election of Officers

6:30 Banquet and Entertainment
Music by Lionaires Quartette
Comic Pantomimes by R. T. Farnsworth

Monday, May 6

9:00 Registration
Lassen Hotel

9:30 CALL TO ORDER AND ANNOUNCEMENTS
Mary Ellen Babb, Wichita, President,
Kansas Medical Assistants' Society

9:40 GREETINGS
Dorris Unger, Wichita, President,
Sedgwick County Medical Assistants'
Society

10:00 REHABILITATION: THIRD PHASE OF MED-
ICINE
Mary Quinn, Wichita,
Vocational Rehabilitation Service

10:30 UTERINE BLEEDING AND CERVICAL CANCER
(WITH FILM)
Edward Crowley, M.D., Wichita

12:00 Luncheon and Program
Dobbs House, Wichita Municipal Airport

GOING THROUGH THE CLINIC
Jane Elder, Wichita,
Secretary to Pastor, First Baptist
Church

1:30 Installation of Officers

Technical Exhibits

1. W. B. Saunders Company
2. Ciba Pharmaceutical Products, Inc.
3. E. R. Squibb and Sons
4. C. B. Fleet Company, Inc.
5. William P. Poythress Company, Inc.
6. Schering Corporation
7. G. D. Searle and Company
8. Ross Laboratories
9. Bilhuber-Knoll Corporation
10. Merck, Sharp and Dohme, Inc.
11. Perdue Frederick Company
12. Commercial Casualty Insurance Company
13. Ames Company, Inc.
14. Lederle Laboratories Division, American Cyanamid Company
15. Burroughs Wellcome and Company
16. Eli Lilly and Company
17. Greb X-ray Company
18. Pet Milk Company
19. Encyclopedia Americana
20. Wyeth, Inc.
22. American Optical Company
23. Blue Shield
24. Julius Schmid, Inc.
25. Ortho Pharmaceuticals Corporation
26. and 27. Mid-West Surgical Supply Company
28. Medical Protective Company
29. A. H. Robins Company
30. Washington National Insurance Company
32. American Ferment Company
33. Mead Johnson and Company
34. Ayerst Laboratories
35. The S. E. Massengill Company
36. Carroll Dunham Smith Pharmacal Company
37. J. B. Lippincott Company
38. Sandoz Pharmaceuticals
40. Coe Surgical Supply Company
43. Doho Chemical Corporation
44. Quinton Duffens Optical Company
46. Goetze Niemer Company
48. William S. Merrell Company
49. Coufal-Kelcket X-ray Company
50. Eaton Laboratories
51. General Electric Company
52. Abbott Laboratories
55. Business Systems Company
56. Borden Company
57. U. S. Vitamin Corporation
60. Pfizer Laboratories
61. A. S. Aloe Company
62. Parke, Davis and Company
63. Burt Krone Company
64. Hoffman LaRoche
65. Baker Laboratories
66. United Medical Equipment Company
67. Zemmer Company, Inc.
80. Thomas A. Edison, Inc.
81. and 82. Coca-Cola Company
83. and 84. Munns Medical Supply Company, Inc.

Telephone Numbers at the Forum, AMherst 5-5054 and AMherst 5-5015

PRESIDENT'S PAGE

DEAR DOCTOR:

As this year draws to a close, I am experiencing mixed emotions. I am glad to give Dr. Barrett Nelson and his new officers the many problems of medicine we were not able to solve.

I am looking forward to the prospect of living on a more regular schedule and being able to return to the practice of medicine again.

I am glad the legislature has adjourned, and even though I am naturally proud over the accomplishments I am nevertheless relieved that the major responsibilities will no longer be my own.

However, the experience of being president of this Society leaves me with many heart warming memories—but none that I shall cherish one-half as much as remembering how many of you gave of your money and of your time, far beyond what anyone had any right to ask, and that you gave this because of your belief in medicine and in its ideals.

To each of you I want to express my most sincere thanks, both in behalf of the Society and for myself personally. You have made it a most wonderful year for me.

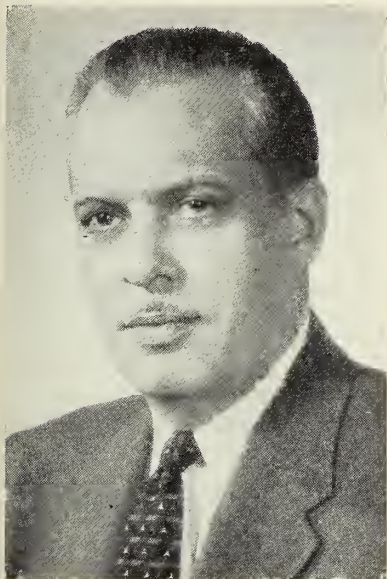
Fraternally,

Clyde H. Miller M.D.

President

President and President-Elect

Introducing the Major Officers of the Kansas Medical Society



Clyde W. Miller, M.D., *President*

Clyde W. Miller, M.D., a great many other achievements notwithstanding, such as the inauguration of the Medicare Plan, will be remembered because of his legislative program.

Under his direction a basic science bill was enacted by the legislature, requiring all future doctors of medicine, of osteopathy, and of chiropractic to pass an examination in the basic sciences, given by a board of professors from the state colleges, before being eligible to apply for a license to practice. Under his direction a law was enacted to create a healing arts board of five doctors of medicine, three doctors of osteopathy, and three chiropractors. Examinations will be given only by that segment of the board holding a license similar to that which is sought by the applicant. The board sits as a unit on enforcement.

This is a pioneering effort designed to raise the minimum education level for practitioners of the healing arts and, as such, ranks with the very few greatest achievements of the Kansas Medical Society during its 98 years of existence.

Barrett A. Nelson, M.D., becomes president on Thursday, May 9, 1957. He brings to this office outstanding personal achievements and national recognition seldom accorded a doctor in this state.

It may well be that when historians a century from today evaluate the achievements of medicine in the mid 20th century they will give most significance to the organization of prepaid health care programs.

Dr. Nelson is the father of Blue Shield in Kansas and has played a significant role in the development of national health care programs. The Society looks forward in anticipation toward a most successful year.



Barrett A. Nelson, M.D., *President-Elect*

Councilor Reports

Activities in the Different Geographical Districts of the State

FIRST DISTRICT

The annual meeting of doctors of the First District and their wives was held at the Sabetha Country Club on October 26, 1956, with excellent attendance. We were fortunate in having as guests Mrs. William J. Biermann of Wichita, president of the Auxiliary; Dr. Clyde W. Miller of Wichita, president of the Kansas Medical Society, and Mr. Oliver E. Ebel, secretary of the Society. After dinner Mrs. Biermann and the members of the Auxiliary retired to the home of Dr. and Mrs. Virgil Brown for a meeting. The doctors were addressed by Dr. Miller who discussed many problems. He stressed the point that the Society represents the doctors of Kansas and that every physician should take a personal interest in its activities.

The Atchison County Medical Society honored Dr. Eugene Bribach at its annual meeting at the Atchison Country Club on January 22. Dr. Bribach, who specialized in eye, ear, nose, and throat work, had completed 50 years of practice in Atchison. Guests included wives of members, Dr. and Mrs. Ralph G. Combs of Leavenworth, Dr. and Mrs. F. E. Wrightman of Sabetha, and Dr. and Mrs. Emerson Yoder of Denton. Dr. Frank Bosse acted as toastmaster.

Frederick E. Wrightman, M.D., *Councilor*

SECOND DISTRICT

The Wyandotte County Medical Society enjoyed considerable variety of interesting programs during the past year. One of the recent programs was a joint meeting with the Medical Assistants' Society for a dinner program which was enjoyed by all. The members of the Auxiliary to the Medical Society were guests at this meeting.

The one outstanding problem of the Second District was a threatened diphtheria epidemic, but through the fine cooperation between the Public Health Department and the Public Health Committee of the Wyandotte County Medical Society this outbreak of diphtheria was confined to one small area and involved the children in only one school.

The orientation program for new doctors coming to the area for the first time has continued in quite a satisfactory manner.

Definite plans are now under way for the meeting of the Kansas Medical Society in the spring of 1958.

J. Warren Manley, M.D., *Councilor*

THIRD DISTRICT

As councilor of the Third District, I have very little to report. There have been no serious controversies and there have been no problems that had to be settled. Lynn County has as yet to organize, and I have heard there is a new doctor now in Pleasant but have not been informed as to his status.

This is my last session as councilor of the Third District and it has been very enjoyable to work with you and the state.

H. Penfield Jones, M.D., *Councilor*

FOURTH DISTRICT

The new Kansas State Tuberculosis Hospital, Chanute, will be opened this spring. This will permit patients in this district, which has the highest incidence of tuberculosis in Kansas, to be treated at home.

The Southeastern Kansas Medical Society has been quite active during the past year.

There is not at present any problem of particular moment confronting the profession in this district.

Charles E. Vestle, M.D., *Councilor*

FIFTH DISTRICT

There has been no change in the status of medicine in the Fifth District during the past year. The councilor has kept the membership in the district informed on problems, projects, Medicare, collection of funds for the American Medical Education Foundation, and other programs.

S. A. Anderson, M.D., *Councilor*

SIXTH DISTRICT

No unusual happenings are to be reported for the past year, but it may be mentioned that the Shawnee County Medical Society voted to assess each member \$15 for the A.M.E.F. and \$5.00 for Science Fairs.

There was a net gain of 6 members during the year, broken down as follows: active members, 9 gained and 2 lost for a total of 160; associate members, 2 lost for a total of 6; residents, 1 gained for

a total of 4; fellowship remains at 2; emeritus status remains at 13. Total membership is 185.

We had the usual number of scientific meetings, a picnic, and an annual meeting which for the first time this year was strictly a social affair.

James A. McClure, M.D., *Councilor*

SEVENTH DISTRICT

To my knowledge, there has been no major problem in the Seventh District during the past year. The one exception to this might be the difficulties encountered in Morris County relative to public health supervision.

Professional relations have been harmonious and medical care generally of very adequate quality and quantity.

Support by individual physicians for the Basic Science and Medical Practice Acts has been noteworthy and productive.

Attendance at the circuit course in Emporia and at other medical meetings has been excellent.

All in all, a fairly good year in District Seven.

Edward J. Ryan, M.D., *Councilor*

EIGHTH DISTRICT

It has been a pleasure to represent the Eighth District as councilor this year. In addition to the ordinary problems that have come before the Society as a whole, we have had the special legislative activity having to do with a new basic science law and medical practice act. The cooperation of the individual doctors in the Eighth District has been rather astounding. When called upon at any time of the day or night, they have responded vigorously and efficiently.

The response to A.M.E.F. contributions and other contributions has been gratifying.

The Medicare program overtook us this year, and it was necessary to adjust ourselves to this new scheme of things. It is now active and, although it does not affect this district greatly, the cases that are being handled seem to be moving along without a great deal of confusion.

We have had no local problems that have not been handled as local problems in a manner satisfactory to all concerned.

The Council meetings, House of Delegates meetings, and special committee meetings have been interesting and, on occasion, a bit of systemic Adrenalin could be noted here and there, but the final decisions were always well thought out and practicable.

I would like to say thank you to all of the doctors

in this district for your support and your willingness to give it. The next year will probably bring problems of adjustment, and I have no doubt that in this district those problems will again be handled efficiently at a local level.

James E. Hill, M.D., *Councilor*

NINTH DISTRICT

There have been no new developments in the Ninth District since the last report was written. Things have gone smoothly as far as this district is concerned. Transferring Ellsworth County from this district has seemed to work out satisfactorily.

This councilor has attended each Council meeting and has endeavored to report back to the local society the important happenings that took place. He would be willing to perform the same duties in any local societies within the district if requested to do so.

L. S. Nelson, Jr., M. D., *Councilor*

TENTH DISTRICT

Improvement in the care of the ill, injured, and handicapped of the state of Kansas seems to be the outstanding point of emphasis of the Kansas Medical Society at this time, and I am making every effort to aid, by encouraging improvement in facilities, training, and interest among our members. There has been a noticeable increase in membership and in professional cooperation in most of the county societies comprising my district, especially in the Reno and Harvey County societies. Attendance at our three Tri-County dinner meetings and at the outstanding annual invitational Reno County dinner meeting and the interest shown are very encouraging. I am trying to keep in close contact with all of my component county societies and am finding evidence of increasing loyalty to and interest in the activities of the Kansas Medical Society.

H. M. Glover, M.D., *Councilor*

ELEVENTH DISTRICT

The Eleventh District has had a fine year with many excellent programs being given at the Sedgwick County Medical Society meetings. There has been an excellent response on the part of the membership to these meetings, and numerous guests from neighboring counties have been in attendance. It is our hope that men from the surrounding area will continue to be our guests at these meetings.

The Auxiliary again had a booth at the Home

Show this year in Wichita and served a vital need in public relations by the distribution of many thousands of pamphlets relative to health affairs of interest to the public.

The Midwest Cancer Conference was again held in Wichita with many excellent speakers, of whom you are all aware, and the attendance was comparable to previous years.

An interesting note is that Sedgwick County has gained 20 new county medical society members during the past year, and there are now 18 probationary members on the roster.

Norton L. Francis, M.D., *Councilor*

TWELFTH DISTRICT

The medical society of the Twelfth District is showing each year a more closely knit and purposeful attitude. During the past year all members of the society have been very cooperative and interested in carrying out the civil, medical, and political objectives as doctors of medicine.

The newly organized auxiliary is establishing itself with well founded aims. The safety council in Sumner County has somewhat run out of steam, but new efforts are being made to keep interest in this important duty before the medical profession and the public.

Albert C. Hatcher, M.D., *Councilor*

THIRTEENTH DISTRICT

The Thirteenth District has encountered no great problems in the past year that a few heavy rains would not take care of.

The response to the request for contributions to the American Medical Educational Foundation has been very generous. A large percentage of the physicians of this district have contributed, both this year and last. Your councilor is appreciative of this response.

Your councilor attended all of the meetings of the Council and of the House of Delegates. It has been a pleasure to serve you this year.

L. W. Reynolds, M.D., *Councilor*

FOURTEENTH DISTRICT

There has been fine cooperation of the members of the Fourteenth District, and the practice of medicine within the district has been on a high plane, I am sure. The membership is happy to be in a position of supporting legislation to improve the standards of medical practice. There has been no particular prob-

lem this year brought to the attention of your councilor. Your councilor wishes to thank each member of this district for their fine attitude and cooperation.

Justin A. Blount, M.D., *Councilor*

FIFTEENTH DISTRICT

It is my pleasure to report that no important problems of a local nature confronted physicians in the Fifteenth District during the past year. I have enjoyed excellent cooperation from the doctors in this district in Society activities, collection of dues, and contributions to various medical funds.

One change worthy of mention is the formation of a new medical group, the Iroquois Medical Society. Physicians in Comanche, Kiowa, Clark, and Meade counties are active members of the organization, and others in the locality who retain membership in different county organizations are associate members. Separate meetings of this society and of its auxiliary will be held regularly. As a member of this society and as councilor for the district, I hereby request that the House of Delegates authorize the issuance of a charter to the Iroquois Medical Society.

L. G. Glenn, M.D., *Councilor*

SIXTEENTH DISTRICT

The medical situation in the Sixteenth District is about the same as last year. Contributions to the A.M.E.F. were considerably below last year. The doctors and their wives were entertained by Dr. and Mrs. Haddon Peck of St. Francis at their ranch in Nebraska, most of the members being present.

Dr. J. T. Swanson, for many years radiologist at St. Thomas Hospital in Colby, has retired and Dr. Martin of Pittsfield, Massachusetts, is at present doing radiology in Colby.

The refresher courses have been well attended, except for two stormy days.

James L. Jenson, M.D., *Councilor*

SEVENTEENTH DISTRICT

The past year has been uneventful in this district. Several new men have settled in this area, and I know of no place needing a doctor at this time. Plans are being made for new hospitals in two localities.

The circuit postgraduate course has enjoyed fair attendance, and several from this district have attended courses at the Medical Center.

H. Preston Palmer, M.D., *Councilor*

Committee Reports

Activities of the Different Special Groups of the State

ALLIED GROUPS

C. R. Rombold, Wichita, Chairman; J. J. Basham, Fort Scott; C. H. Benage, Pittsburg; H. O. Bullock, Independence; W. M. Cole, Wellington; R. D. Dickson, Topeka; F. B. Emery, Concordia; J. H. Holt, Wichita; H. F. Janzen, Hillsboro; G. D. Marshall, Colby; J. Neuenschwander, Hoxie; R. H. O'Donnell, Ellsworth; R. E. Stowell, Kansas City; S. L. Vander Velde, Emporia.

At a meeting of the Committee on Allied Groups held in Wichita in November, a decision was made that its function was useful enough to the Kansas Medical Society that it should adopt a program of action. There is in preparation a series of meetings to be held over the state in which an effort will be made to better understand the mutual problems besetting the pharmacists and physicians. Definite dates have not yet been set, nor has the program been completed.

Charles Rombold, M.D., *Chairman*

AUXILIARY

C. O. West, Kansas City, Chairman; W. J. Biermann, Wichita; C. V. Black, Pratt; E. M. Harms, Wichita; B. A. Nelson, Manhattan; R. E. Pfuetze, Topeka; C. E. Stevenson, Neodesha; I. J. Waxse, Oswego.

It is with a great deal of pleasure that we make the following report in regard to the Woman's Auxiliary to the Kansas Medical Society.

There has been an increase in membership and a marked interest in the Auxiliary at both county and state level.

The Auxiliary has had its usual fine success in the distribution of *Today's Health*, ranking among the top states of the nation in this fine program. Special emphasis was made on reception room readership.

Members have been ever mindful of the legislative program of the medical society, presenting to the lay public information that has aided in passing the new medical laws.

The Auxiliary has continued to aid public relations through the media of health education teas. In addition, two new ideas were developed. First was

distribution of the pamphlet, "Winning Ways With Patients," to the doctors' wives who were asked to read it and then give it to their husbands for use of the medical assistants in their offices. Second was promotion of the essay contest of the Association of American Physicians and Surgeons, a contest for high school students designed to promote right thinking among the youth against socialized medicine and to point out the value of the free enterprise system in our nation.

The A.M.E.F. program has been stressed with fine results.

Special emphasis was given safety and rehabilitation, a new project on the national and state level. Members of the Auxiliary were encouraged to promote safety programs in local civic organizations of which they are members. The Auxiliary has also been represented at the meetings of the Kansas Citizens Safety Council.

The nurse recruitment program of the Auxiliary is being felt in the hospitals throughout the state. The Auxiliary has continued to promote nurse recruitment through Future Nurse Clubs and scholarships and student loan funds. In addition, it has again conducted a survey of scholarships and loan funds available in the state for the Kansas League of Nursing.

The Auxiliary has also participated in Civil Defense program stressing home preparedness, home nursing programs, and individual participation in Civil Defense activities.

The Auxiliary, with the splendid leadership of Mrs. W. J. Biermann, has done outstanding work the past year, and the Auxiliary Committee is happy to have had the opportunity of working with them.

C. Omer West, M.D., *Chairman*

BLUE SHIELD FEE SCHEDULE

A. G. Isaac, Newton, Chairman, Urology; W. L. Beller, Topeka, Radiology; H. J. Brown, Winfield, Anesthesiology; D. R. Davis, Emporia, Pediatrics; K. L. Druet, Salina, Internal Medicine; T. L. Foster, Halstead, Psychiatry; N. L. Francis, Wichita, ENT; W. H. Fritzemeier, Wichita, Dermatology; J. E. Hill, Arkansas City, Ophthalmology; G. B. Joyce, Topeka, Orthopedics; J. G. Kendrick, Wichita, Obstetrics and Gynecology; R. G. Klein, Dodge City, General

Surgery; W. R. Lentz, Seneca, General Practice; C. A. Newman, Topeka, General Practice; W. J. Reals, Wichita, Pathology.

During this administration, one meeting of the committee was held (September 9, 1956). The purpose of the meeting was to come up with a fee schedule for Medicare. President Miller had been at several meetings on a higher level and brought to this group the thinking that was going on nationally, and emphasized the urgency of our action to conform with the time-table of the Defense Department of the U. S., which will administer the Servicemen's Dependents Medical Care Act.

The discussion was lively but altogether constructive. It was decided to submit to the Council of the Society a schedule which, in general, followed the Kansas Blue Shield \$6,000 plan, but with many exceptions, which were presented by the representative on our committee of each specialty. The \$6,000 plan, of course, had never been adopted by the Blue Shield Board and the Kansas Medical Society, but was a schedule on which the committee had previously spent considerable time and which was available to us.

It was also decided to recommend to the Council of the Kansas Medical Society that Kansas Blue Shield be the fiscal agent for the program in Kansas, and that the official spokesman be the governing body of the Kansas Medical Society.

All the members of the committee were very cooperative.

Arnold G. Isaac, M.D., *Chairman*

BLUE SHIELD RELATIONS

D. G. Laury, Ottawa, Chairman; A. W. Beahm, Great Bend; P. L. Beiderwell, Belleville; M. A. Brewer, Ulysses; E. W. Christmann, Wamego; J. H. Coffman, Oberlin; J. A. Dunagin, Topeka; W. A. Grosjean, Winfield; P. Irby, Fort Scott; J. L. McGovern, Wellington; J. H. McNickle, Ashland; J. L. Morgan, Emporia; R. T. Nichols, Hiawatha; W. J. Pettijohn, Russell; H. R. Schmidt, Newton; L. N. Speer, Kansas City; C. M. White, Wichita.

This committee has spent a great deal of its time discussing the composition of the Blue Shield board. It was felt that in the near future the committee will act to inform the physicians of Kansas how Blue Shield board members are elected. The committee will endeavor to determine whether there is a better way to elect board members than that currently employed. The committee will try to solve this and other problems in an active physician-Blue Shield relations program during the coming year.

The committee approved a new plaque for physicians' offices. This will be distributed to all participating physicians soon.

The committee is attempting to set up a plan whereby those who wish to make criticisms of Blue Shield will have a channel through which to do so. All complaints should be sent to the Blue Shield Committee, and reports on these matters will be studied and a reply will be sent to the person concerned and to the Blue Shield board.

D. G. Laury, M.D., *Chairman*

CENTENNIAL

T. P. Butcher, Emporia, Chairman; Shawnee County Chairman; E. W. Crow, Wichita; W. M. Mills, Topeka; B. A. Nelson, Manhattan; G. R. Peters, Kansas City; R. Sohlberg, Jr., McPherson; W. C. Wescoe, Kansas City.

A number of preparations for the centennial celebration of the Society have progressed during the past year, mostly as projects of other committees, however.

As will undoubtedly be reported elsewhere, the history project is showing progress, and it is believed every member will receive a printed history of medicine in Kansas during the centennial year.

A second project is the very significant accomplishment of having Kansas host the National Rural Health Conference in Wichita in 1959. Plans are already under way for entertainment, for the program, and for housing. Plans are also being made for national publicity for this meeting to tie it in with the founding of the Kansas Medical Society.

Since 1959 will be the next regular legislative session, and since the first governor, the first lieutenant governor, and the first secretary of state of Kansas were physicians, plans are in preparation for some kind of formal recognition of this Society by the Kansas legislature.

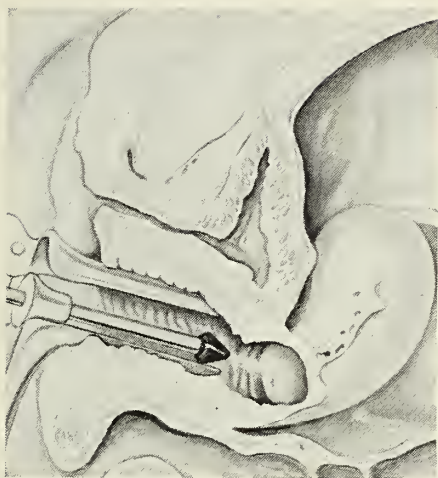
In the past Kansas has not submitted a candidate for the title of General Practitioner of the Year. There are plans that some Kansas physician will be nominated for this award in 1959 in an effort to have him selected for this national honor.

Negotiations are in progress with the Kansas Historical Museum to have an extensive exhibit on the subject of pioneer medicine on display throughout 1959.

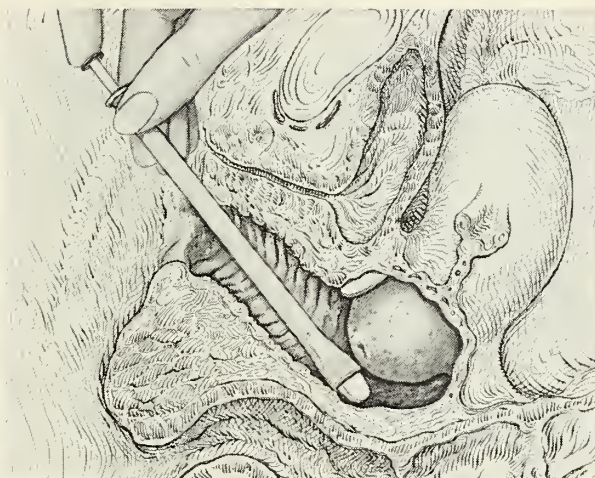
The chairman of the committee planning the scientific program for the 1959 meeting of this Society is making preliminary arrangements for an outstanding program for this event.

It is recommended that this committee accelerate its efforts during the coming year to make final prepa-

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Floraquin® Rebuilds the Defense Mechanism in Vaginitis

Combined office and home treatment with Floraquin provides a comprehensive regimen which encourages restoration of the normal "acid barrier" to pathogenic infection.

Vaginal secretions normally show a high degree of protective acidity (pH 3.8 to 4.4). When this "acid barrier" is disturbed, growth of benign Döderlein bacilli is inhibited and that of pathogens encouraged. Floraquin not only provides an effective protozoacide and fungicide (Diodoquin®) destructive to pathogenic trichomonads and yeast, but also furnishes sugar and boric acid for reestablishment of the normal vaginal acidity and regrowth of the normal protective flora.

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"... the vagina is treated daily by swabbing with green soap and water, drying and insufflation of Floraquin powder."*

Suggested Home Floraquin Treatment

"The patient is also issued a prescription for Floraquin vaginal suppositories which she is instructed to insert high into the vagina each evening. On the morning following each application of these suppositories, the patient should take a vinegar water douche. . . ."

A Floraquin applicator is supplied with each box of 50 Floraquin tablets. G.D. Searle & Co., Chicago 80, Illinois, Research in the Service of Medicine.

*Williamson, P.: Trichomonad Infestation, M. Times 84:929 (Sept.) 1956.

SEARLE

rations on many events that might be scheduled for this centennial year. The committee will welcome any suggestions from members of the Society.

T. P. Butcher, M.D., *Chairman*

CHILD WELFARE

D. R. Davis, Emporia, Chairman; W. H. Crouch, Topeka; W. P. Hibbett, McPherson; E. D. Hinshaw, Arkansas City; T. C. Hurst, Wichita; A. C. Irby, Fort Scott; H. P. Jubelt, Manhattan; W. F. McGuire, Wichita; O. L. Martin, Salina; L. N. Speer, Kansas City; H. J. Williams, Osage City.

This committee met in Emporia three times during the year. For purposes of continuity, chairmen of the Kansas Chapter of the American Academy of Pediatrics were asked to attend in a consultatory status.

It is planned to have a regular child welfare page in the JOURNAL. Dr. Thomas C. Hurst of Wichita was appointed as permanent chairman of this project. As soon as a year's back log of material is available, the page will be initiated.

Dr. Ted Young of Winfield, Academy of Pediatrics chairman of section on Fetus and Newborn, stimulated interest in the study of perinatal mortality.

The feasibility of the establishment of poison control centers is being studied by Dr. William Crouch, Topeka, and his committee.

Studies related to problems of mentally retarded children are being conducted by Dr. Mary Boyden, Lawrence.

Dr. Helen Gilles, Lawrence, is active with her Committee on Juvenile Delinquency.

Dr. Hilbert Jubelt, Manhattan, has been actively interested in promotion of a realistic state school health program, maintaining close relationship between the child and the family physician or pediatrician.

The committee has been most interested in these projects and hopes to maintain continuity in their studies.

D. R. Davis, M.D., *Chairman*

CONSERVATION OF EYESIGHT

W. M. Scales, Hutchinson, Chairman; B. J. Ashley, Topeka; L. L. Calkins, Kansas City; M. A. Carter, Wichita; J. E. Hill, Arkansas City; D. O. Howard, Wichita; M. S. Lake, Salina; D. T. Loy, Great Bend; H. E. Morgan, Newton; D. P. Trimble, Emporia; D. D. Vermillion, Goodland.

The Committee on Conservation of Eyesight met once during the past year.

Since plans for a program on EENT at the time of the 1957 state meeting were cancelled because of a conflict, the committee recommended that a speaker on eyesight and hearing be invited to participate in the general program.

Doctors Ashley, Calkins, and Howard were appointed to a committee to prepare a bill of particulars on a proposal of the American Board of Ophthalmology to set up two types of certification, only one of which would be certification for ophthalmological surgeons. The bill of particulars is to be presented to the Section on Ophthalmology at the annual meeting of the Kansas Medical Society in May.

The chairman was asked to report to the House of Delegates on the advisability of establishing a separate Board of Surgery in the American Board of Ophthalmology and to recommend (1) the needs of Kansas or (2) that a study be conducted to determine such needs.

The committee endorsed the principle that the state supervising ophthalmologist be selected from a list of collaborating ophthalmologists. Because the chairman of the committee was ill and was unable to call a meeting of the group at the time of expiration of the term of Dr. Karl W. Stock, it was recommended to the Kansas State Board of Social Welfare that he be continued in office until July 1.

It was recommended that Dr. Stock and others be invited to discuss the Aid to the Blind Program at the next meeting of this committee, at the time of the postgraduate course on ophthalmology.

The chairman appointed Dr. Hill chairman of a committee to review the Blue Shield schedule of fees for eye services.

William M. Scales, M.D., *Chairman*

CONSERVATION OF HEARING AND SPEECH

R. Montgomery-Short, Halstead, Chairman; C. W. Armstrong, Salina; J. A. Budetti, Wichita; C. L. Gray, Wichita; E. E. Miller, Pittsburg; V. R. Moorman, Hutchinson; W. D. Pitman, Pratt; G. O. Proud, Kansas City; R. E. Riederer, Olathe.

Many matters were discussed by this committee at a meeting held in February.

After study of the method of screening deaf students at the Olathe School for the Deaf, Dr. Riederer was assigned the task of supplying information on the screening procedure to all committee members.

The committee recommends that all deaf persons should have an otological examination before being fitted with any hearing aid.

Also recommended was preparation of a scientific exhibit on problems of hearing for the annual meeting of the Society. It was suggested that such an exhibit be prepared annually.

Tuesday Evening, May 7, 7:00 P.M.

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**AN UNPRECEDENTED EVENT AS
Kansas Doctors Host the Pharmacists**

**The love (?) life
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***THEN for your gratification and enlightenment the VEIL OF
SECRECY surrounding their dissolute relationships will be torn
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OPPORTUNITY OF A LIFETIME TO

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Have a good SOCIABLE time and a good dinner for \$3.50

This event provides dinner and entertainment for physicians while their wives are attending a dinner of the Woman's Auxiliary to the Kansas Medical Society. However, this party is not a stag affair and ladies are welcome.

This Program Presented by K.M.S. Committee on Allied Groups

Dr. Budetti was asked to contact the Kansas State Board of Social Welfare to secure information on a program to benefit the pre-school age deaf child. Additional information on this subject is to be secured from the State School for the Deaf, the University of Kansas Medical Center, and the State Department of Special Education.

A report of the Subcommittee on Noise in Industry will be made at the time of the annual session.

R. Montgomery-Short, M.D., *Chairman*

CONSTITUTION AND RULES

A. W. Fegty, Wichita, Chairman; H. S. Bowman, Wichita; G. L. Thorpe, Wichita; H. B. Vallette, Beloit; C. E. Vestle, Humboldt.

In this report the committee brings to the attention of the House of Delegates several important suggestions. The first has been brought to your attention before but should be emphasized. This cannot be accomplished by immediate change in the By-Laws, cannot be satisfactorily accomplished by mandate, but can be accomplished after voluntary cooperative consideration of individual component societies working with their councilors and the executive office.

(A) This Society is at present composed of 67 component societies, most of which are single county organizations. Of this number, 44 list less than 20 members, and of these 25 list less than 10 members. Records show that many of these same component societies fail to send delegates to sessions of the House of Delegates, which are the business meetings, and also do not attend scientific meetings of the state Society. In the early days of slow transportation and poor roads the small county organization was necessary, and it was presumed that each should have a voice and complete knowledge of all matters pertaining to the state organization. It is a well established fact that the greater the number of members in each component society, the greater individual interest and benefit, the more powerful influence, and the wider the possible exchange of ideas in the work proposed or carried out by the state Society. We therefore again urge that each of the smaller county societies cooperate and plan with neighboring county societies, preferably in the same councilor district, and with the help of councilors and the central office, to form multi-county societies, consisting of more than 20 members. If this is accomplished, each will find greater interest in membership, greater value to individual members, and to the state organization. It is hoped that this may be accomplished this year. Changes in the By-Laws will then be necessary after new charters are granted by the Council.

(B) Continued search for existing charters of component societies or dates of issuance has been fruitless. We again call attention to our recommendation last year (1956) that the Council should issue new charters to all component societies. These should carry the parenthetical notation "Charter issued to replace original, lost or destroyed." These can best be issued to all component societies retained, and original charters issued to multi-county societies formed by merger suggested in (A).

(C) There are many organizations closely related to this Society as to functions and work, who may think it wise to inform the House of Delegates of some of their actions connected with the medical society. We therefore recommend that invitations in the name of the Society be extended to such as:

President of the Woman's Auxiliary to the Kansas Medical Society

President of the Kansas Medical Assistants' Society

President of Blue Shield

Chairman of the Kansas State Board of Medical Registration and Examination

Dean of the University of Kansas School of Medicine

and any others allied to the Society and desired by the president. This invitation is to suggest that, if desired, a written report be sent to the executive secretary not later than 60 days prior to the annual session, to be printed together with our regular reports of Society work for presentation to the House of Delegates.

(D) We also offer for consideration a series of amendments which we feel will condense and shorten the time necessary for the meetings of the House of Delegates, provide source of information of the complete year's work of the Society in printed form, either in the JOURNAL or in a handbook for the delegates. Important work, projects, or proposals requiring approval of the Society will be handled more easily and expeditiously. Some unnecessary or obsolete committees are eliminated and new ones included.

AMENDMENT NO. 1

By-Laws, Chapter V, Section 8.—The agenda revised to read:

1. Registration of Delegates, ex-officio members and visitors.
2. Call to order by the President.
3. Announcement of number of Delegates, ex-officio members present and registered and the presence of an official quorum.
4. Reading of the minutes of last and any special meeting.

Recent Advances

In Feeding Prematures

Recent metabolic studies have established rational feeding procedures for prematures.

The initial feeding, 12 hours after birth, consists of one dram of 5 per cent dextrose. This solution is increased by one dram at 2-hour intervals if tolerated and retained.

After twenty-four hours, breast milk or formula (table below) gradually replaces the prelacteal feeding at 2-hour intervals. The volume of a feeding may be increased up to 2 drams daily until maintenance caloric requirements are fulfilled by the fifth day. If the infant shows signs of intolerance, the formula increase is made more slowly and the fluid requirement fulfilled parenterally.

Successful feeding mixtures consist of dilutions of powdered half-skimmed or evaporated

whole cow's milk, skimmed or whole lactic acid milk. These formulas contain high protein, moderate carbohydrate and low fat, yielding about 120 calories and 150 cc. fluid per kgm. body weight.

The problems of prematures are always the same but the solutions differ with each era. Today the moderate carbohydrate requirement for normal infants as well as prematures is fulfilled by KARO® Syrup as adequately as a generation ago. Whatever the type of milk adapted to the infant, KARO may be added confidently because it is a balanced mixture of lower sugars resistant to fermentation, non-laxative, easily assimilated and well tolerated by all infants.

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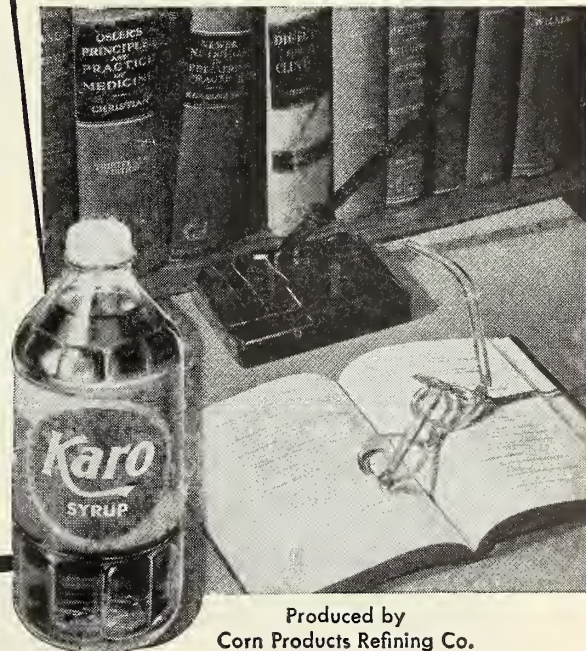
| R_x FIRST FORMULAS FOR PREMATURES | |
|--|---------|
| Fresh or whole lactic acid milk | 6 oz. |
| Water | 12 oz. |
| KARO | 1 oz. |
| Evaporated milk | 3 oz. |
| Water | 15 oz. |
| KARO | 1 oz. |
| Dried milk (half-skimmed) | 4 tbsp. |
| Water | 18 oz. |
| KARO | 1 oz. |

Feedings: 1½ oz. x 12 x 2 hours
Measures: 1 oz. KARO = 2 tablespoons

Caloric values: KARO, 120 per oz.; Cow's milk, 20 per oz.; Evaporated milk, 45 per oz.; Dried milk (½ skimmed), 35 per oz. (Vol.).

Equivalents: Red Label KARO or Blue Label KARO may be used interchangeably in all formulas.

Adapted from Nelson's Pediatrics, Saunders, Phila. 1954



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5. Report of Reference Committee on reports printed in the JOURNAL with details of recommendations and resolutions therein requiring action by the Society.
6. Supplemental reports from committees or officers.
7. Report of Executive Secretary.
8. Report of the Treasurer.
9. Unfinished business.
10. New business and resolutions offered.
11. Address of the President (if desired).
12. Address of the President-Elect (if desired).
13. Announcements—to include time and place of Reference Committee meeting.
14. Adjournment to reconvene at second meeting.

AMENDMENT NO. 2

By-Laws, Chapter XI, Section 1a. Amend as follows:

| | |
|---|---------|
| Delete Committee of Advisory Past Presidents | Sec. 35 |
| Delete Committee on Venereal Diseases | Sec. 34 |
| Change name of Committee on Hospital Survey to Committee on Hospitals | Sec. 21 |
| Include Committee on Anesthesiology | Sec. 38 |
| Include Committee on Gerontology | Sec. 39 |
| Include Committee on Safety | Sec. 40 |

AMENDMENT NO. 3

By-Laws, Chapter XI, Section 1b. Amend to read:
Special Reference Committee on Reports printed in the JOURNAL.

Special Reference Committee on Recommendations and Resolutions.

AMENDMENT NO. 4

By-Laws, Chapter XI, Section 3, Paragraph 1:

- (a) Line 1, delete word "special" and remove parentheses from word "temporary."

By-Laws, Chapter XI, Section 3, Paragraph 2. Amend to read:

- (b) Special Reference Committee on Reports printed in the JOURNAL, to consist of two or more members, shall be appointed at least 30 days before each annual session. Their duties shall be to review all reports printed in the JOURNAL and prepare written report giving in detail each recommendation or resolution proposed which requires approval or disapproval of the House of Delegates. Their report merely establishes that these matters require action by the House of Delegates, but may recommend that the reports AS PRINTED, with the exception of the specific items given, be approved as published.

- (c) The Special Reference Committee on Recommendations and Resolutions, to consist of five or more, shall be appointed at least 30 days before each annual session. They shall meet at a designated time and place between the sessions of the House of Delegates for consideration of all recommendations and resolutions presented to the House of Delegates requiring specific action or policy of the state Society after public hearings on the same. They shall report, complete with recommendation for approval, disapproval, or adoption, in writing, their conclusions on each subject to the second or last meeting of the House of Delegates.

- (d) By-Laws, Chapter XI, Section 3, Paragraph 3. Shall be deleted.

AMENDMENT NO. 5

By-Laws, Chapter V, Section 19. House of Delegates. Amend by the addition of paragraph to be No. 1:

- a. Section 19: All reports and resolutions for consideration of the House of Delegates to be published in advance of the annual session shall be sent to the executive office at least six weeks before the date of the annual session. Any supplementary reports or resolutions by individual members or component societies, to be acted upon by the House of Delegates, and not sent in time for publication, shall be written and three copies shall be sent to the Executive Office not less than five days before the annual session.
- b. Permission is requested upon the reprinting of the By-Laws to include, in duties of Defense and Editorial Boards and certain officers where it has been omitted:
"Written report shall be made annually to the House of Delegates."

AMENDMENT NO. 6

By-Laws, Chapter VI, Section 3. Election of Officers. Shall be amended to read:

Section 3. All elections of officers shall be by secret ballot unless a single candidate is nominated for office, whereupon the vote may be given viva voce. If upon any ballot for three nominees no nominee shall receive a majority vote, the nominee receiving the smallest number of votes shall be dropped and the balloting continue until a majority is obtained: Further when there are more than three nominees for an office and upon the first ballot no majority vote is obtained, all candidates having less votes than any one of the highest three shall be

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| ACHROMYCIN® Tetracycline | 125 mg. |
| Phenacetin | 120 mg. |
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dropped and voting continue as outlined above for three candidates. Nominations for all offices may be made from the floor in addition to the recommendations of the Nominating Committee before balloting begins.

AMENDMENT NO. 7

By-Laws, Chapter XI, Section 30. Amend to read:

Section 30. The Committee on Public Policy shall be composed of the Executive Committee of the Council, all active Past-Presidents, and such other members as deemed advisable. Under the direction of the Council it shall represent the Society in keeping in touch with professional and public opinions and ADVOCATE legislation to secure the best possible medical results for the whole people and promote the general good of the community in local, state, and national affairs and elections. Sub-committees for special purposes may be formed. Meetings shall be held at the call of the President.

AMENDMENT NO. 8

By-Laws, Chapter XI, Section 38. Shall read:

The Committee on Anesthesiology shall consist of at least five members. It shall be the function of this committee to stimulate interest among anesthetists both full time and part time in preparing papers for publication; to study post-surgical deaths in the hospitals of the state; to encourage all anesthesiologists to participate fully in all component society meetings, with emphasis on improving the safeguards to patients requiring anesthesia, and to co-operate in furthering the purposes and the meetings of the Kansas Society of Anesthesiologists. Meetings shall be called by the chairman. At least one-half of the membership shall have served on the retiring committee.

AMENDMENT NO. 9

By-Laws, Chapter XI, Section 39. Shall read:

Section 39. The Committee on Gerontology shall be composed of five or more members appointed by the President. Its purpose shall be to study the medical, social and economic aspects of gerontology. They shall also study methods of establishing, controlling, licensing, and improving nursing homes for the care of the aged. They shall endeavor to assist and co-operate with such departments of state government whose business it is to supervise such homes. They shall meet at the call of the Chairman. At least one-half the membership shall have served on the retiring committee.

AMENDMENT NO. 10

By-Laws, Chapter XI, Section 21. Amend to read:

Section 21. The Committee on Hospitals shall consist of five or more members, one of whom shall

be the member serving on the Kansas Hospital Advisory Commission. The duties of this committee shall be to consider the problems of the hospitals of the state, co-operate with the Hospital Committee of the American Medical Association, the Kansas Hospital Advisory Commission, and the Joint Commission on Accreditation, and endeavor to secure proper rating and accreditation of hospitals and satisfactory physician-hospital relations. Meetings shall be called by the Chairman. At least one-half the membership shall have served on the retiring committee.

AMENDMENT NO. 11

By-Laws, Chapter XI, Section 40. Shall read:

Section 40. The Committee on Safety shall consist of at least five members. It shall be the duty of this committee to study the medical aspects of safety programs of all agencies, public and private, to coordinate similar studies from all sources, and to recommend and initiate such action as may be deemed necessary, advantageous, and proper for the members of the Society. At least one-half of the committee membership, one of whom is the retiring chairman, shall have served on the retiring committee. Meetings shall be called by the Chairman.

Above amendments are presented by the committee with recommendation for adoption by the House of Delegates at the second session May 9, 1957.

In conclusion I wish to thank the members of the committee, Doctors Thorpe, Bowman, Vestle, and Vallette, the Executive Secretary Oliver Ebel, and President Dr. Clyde Miller for able advice and assistance in the preparation of these amendments.

A. W. Fetgly, M.D., *Chairman*

CONTROL OF CANCER

D. C. Reed, Wichita, Chairman; J. P. Berger, Wichita; C. G. Bly, Kansas City; T. P. Butcher, Emporia; A. M. Cherner, Hays; J. C. Dysart, Sterling; A. A. Fink, Topeka; W. A. Grosjean, Winfield; H. L. Hiebert, Topeka; W. J. Kiser, Wichita; J. R. Kline, Wichita; C. H. Miller, Parsons; N. C. Nash, Wichita; R. H. Riedel, Topeka; L. E. Vin Zant, Wichita; H. M. Wiley, Garden City.

This committee has held four meetings this past year with excellent attendance at each.

The Midwest Cancer Conference, jointly sponsored by the Kansas Division of the American Cancer Society and the Kansas Medical Society, was held in Wichita, March 7 and 8. The committee met at this time to formulate plans and select speakers for the tenth annual meeting to be held in 1958. It was

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decided that a program of primary interest to the general practitioner would be in order, and the program committee chairman, Dr. Chauncey Bly, was requested to formulate such an agenda for further consideration.

A permanent subcommittee of the Committee on Control of Cancer was appointed for the purpose of conducting a continuous study and evaluation of all phases of the hospital cancer program in Kansas. The pro-tem chairman, Dr. R. H. Riedel, presented a preliminary report and recommendations pertinent to this subcommittee's functions at the January 21 meeting. It is the consensus of the group that much pertinent information concerning the value of individual diagnostic tumor clinics, current cancer statistical reporting methods, etc. will be forthcoming from this subcommittee.

Inasmuch as the membership of this committee is identical with that of the Medical and Scientific Committee of the Kansas Division of the American Cancer Society, considerable time has been devoted to the consideration of various project requests, etc., a discussion of which is not pertinent to this report.

The chairman of this committee wishes to take this opportunity of expressing his sincere appreciation for the loyal cooperation afforded him by the individual members of the committee.

D. Cramer Reed, M.D., *Chairman*

CONTROL OF TUBERCULOSIS

J. W. Spearing, Columbus, Chairman; A. L. Ashmore, Wichita; A. Baude, Topeka; J. A. Butin, Chanute; R. I. Canuteson, Lawrence; M. J. Fitzpatrick, Kansas City; J. L. Morgan, Emporia; C. Pokorny, Halstead; C. F. Taylor, Norton; P. H. Wedin, Wichita.

Again this year our activities have been interesting. Traditional obstacles were not circumvented. It was reassuring when the recording of a dissenting vote was requested. The challenge to a tuberculosis committee is stimulating.

Each member of this committee has exhibited great zeal and dedication in arriving at the best possible answers. No member missed more than one meeting. Attendance was excellent. In addition, the majority attended the annual meeting of the Kansas Tuberculosis and Health Association and/or one of its district meetings. At each of these sessions, exchange of ideas was encouraging and beneficial.

The Stocklen report was dealt with in detail and has been given high commendation.

The laws of several states relating to the quarantine and isolation of the tuberculous, especially in re-

gard to the recalcitrant patient, were reviewed. Not being unmindful that the most desirable and most effective method is proper doctor-patient relationship with proper lay education, the committee has submitted to the state health officer, for his approval and action, what we believe to be a good law.

Joseph W. Spearing, M.D., *Chairman*

EMERGENCY MEDICAL CARE

D. P. Trees, Wichita, Chairman; G. L. Ashley, Chanute; A. H. Bacon, Wichita; K. F. Bascom, Manhattan; F. C. Beelman, Topeka; R. M. Brooker, Topeka; L. F. Glaser, Hutchinson; A. E. Hiebert, Wichita; H. H. Hyndman, Wichita; G. E. Manahan, Lawrence; G. R. Peters, Kansas City; W. A. Smiley, Jr., Junction City; R. E. Speirs, Dodge City; J. F. Thurlow, Hays.

No meetings of the Committee on Emergency Medical Care have been held, and there have been no called meetings by the State Civil Defense Council.

Donald P. Trees, M.D., *Chairman*

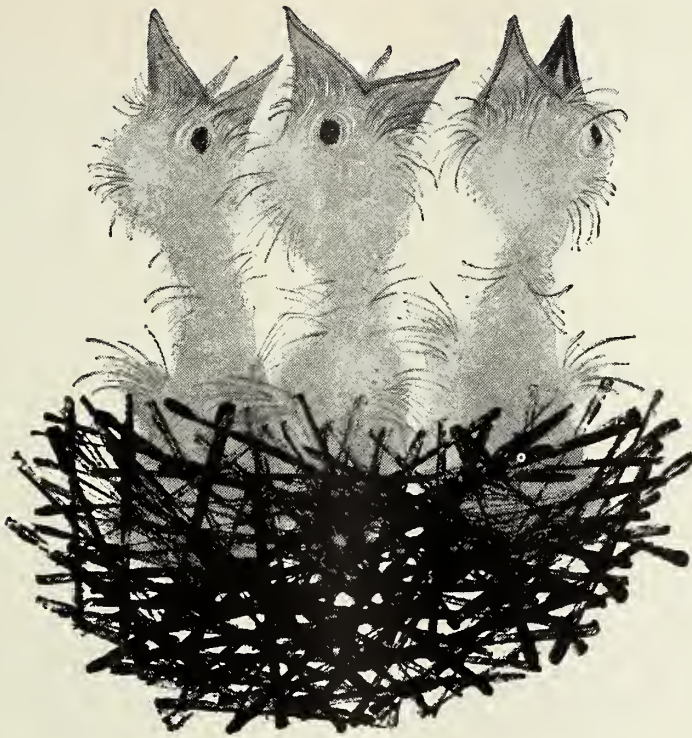
ENDOWMENT

C. V. Black, Pratt, Chairman; J. A. Howell, Wellington; D. C. McCarty, Medicine Lodge; R. A. Nelson, Wichita; J. W. Randell, Marysville.

The national committee of the American Medical Education Foundation met on January 27, 1957, to review the progress of 1956. A.M.E.F. was first instigated to get the National Foundation for Medical Education started. This group is now off to a good start on its own and does not need the assistance of the A.M.A. group any further. The National Fund discouraged school-designated gifts, and this caused conflicts with the alumni associations of the various medical schools. It was therefore decided to separate the two organizations, each working independently. This will encourage the doctors to give through A.M.E.F. and let them designate their medical schools.

In total contributions, Kansas was up from \$10,525 for 1955 to \$14,902 for 1956. One doctor gave \$1,615 through A.M.E.F. The Kansas Medical Society gave \$5,085, and the Golden Belt Medical Society gave \$500. The various women's auxiliaries gave \$935.25. There were 14 individual contributors of \$100 or more.

The number of contributors, however, was down from 395 in 1955 to 348 in 1956. There were several 100 per cent societies led by Topeka, then Ar-



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| Elemental Iron | 38 mg. |
| (as ferric ammonium citrate and colloidal iron) | |
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| Riboflavin | 1.0 mg. |
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| Pyridoxine hydrochloride | 0.5 mg. |

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kansas City, Hays, and Pratt. There were far more contributors from western Kansas than elsewhere. There were 26 from Wichita and 22 from Kansas City, most of the latter contributors being on the faculty of the medical school. Several large towns had no contributors.

Most states are turning to state assessments. They have found that even though there is an assessment, there have been more large gifts than before. One doctor told me that he has fixed his will so that there would be a grant for A.M.E.F. However, if you think this is a good showing, remember that the doctors of Colorado, a state smaller and worse hit by the drought, gave \$29,000 last year.

Your committee has had meetings with the dean of the medical school and with the heads of the endowment association of the University of Kansas. There is the fullest cooperation between the two groups. We entreat you to make your gifts to A.M.E.F. this year. Doctors who consider giving to their medical schools and A.M.E.F. must remember that this is not settling for an obligation of the past but is an attempt to take care of present progress which you are or should be making.

Cyril V. Black, M.D., *Chairman*

GENERAL PRACTICE AWARD

G. L. Thorpe, Wichita, Chairman; C. M. Barnes, Seneca; C. W. Bowen, Topeka; L. G. Glenn, Protection; A. C. Harms, Kansas City; L. E. Leigh, Overland Park.

This committee has been in existence for three years and, although no nomination has been submitted to the A.M.A. for consideration of the award of General Practitioner of the Year, your previous committees have prepared the groundwork which we anticipate will produce a suitable candidate during the Kansas centennial year. The members of this committee, therefore, bring no recommendation to the Society at this time but are actively working to promote the selection of a Kansas physician for this award during the Kansas Centennial Celebration.

George L. Thorpe, M.D., *Chairman*

HISTORY

W. M. Mills, Topeka, Chairman; J. F. Barr, Ottawa; H. C. Clark, Wichita; R. R. Melton, Marion; C. C. Nesselrode, Kansas City; R. A. Schwegler, Lawrence; G. S. Voorhees, Leavenworth.

As reported by this committee last year, a history of the Kansas Medical Society is being written by

Prof. Tom Bonner of the University of Omaha. With the assistance of the Department of History of the University of Kansas, Prof. Bonner has completed a great deal of research and is continuing work on the project. The book will be published for distribution by May of 1959.

Several appeals have been sent to county medical societies and to the hospitals of Kansas for any data of interest in the history of medicine in this state.

Work has progressed also on the collection of material for displaying a pioneer doctor's office at the State Historical Society. The project has grown to a point where additional material is still desired but the historical society is becoming selective in what will be used. Still of interest are unusual instruments or unusual or very old office equipment. Those having items of this kind are invited to correspond with the committee.

W. M. Mills, M.D., *Chairman*

HOSPITAL SURVEY

R. W. Myers, Newton, Chairman; A. C. Armitage, Hutchinson; L. E. Beal, Fredonia; E. Beebe, Olathe; W. M. Campion, Liberal; P. S. Combs, Leavenworth; E. R. Gelvin, Concordia; E. T. Gertson, Atwood; G. F. Gsell, Wichita; H. S. O'Donnell, Ellisworth; A. J. Rettenmaier, Kansas City; A. E. Rueb, Salina; R. E. White, Garnett; J. K. Wisdom, Wichita.

No demands were made on this committee during the past year, so no meetings were held.

R. W. Myers, M.D., *Chairman*

INDUSTRIAL MEDICINE

W. L. Anderson, Atchison, Chairman; E. S. Brinton, Wichita; I. W. Cain, Kansas City; L. A. Donnell, Wichita; J. A. Grove, Newton; A. R. Mueller, Leavenworth; J. H. A. Peck, St. Francis; H. L. Regier, Kansas City; M. F. Russell, Great Bend; R. W. Urie, Parsons.

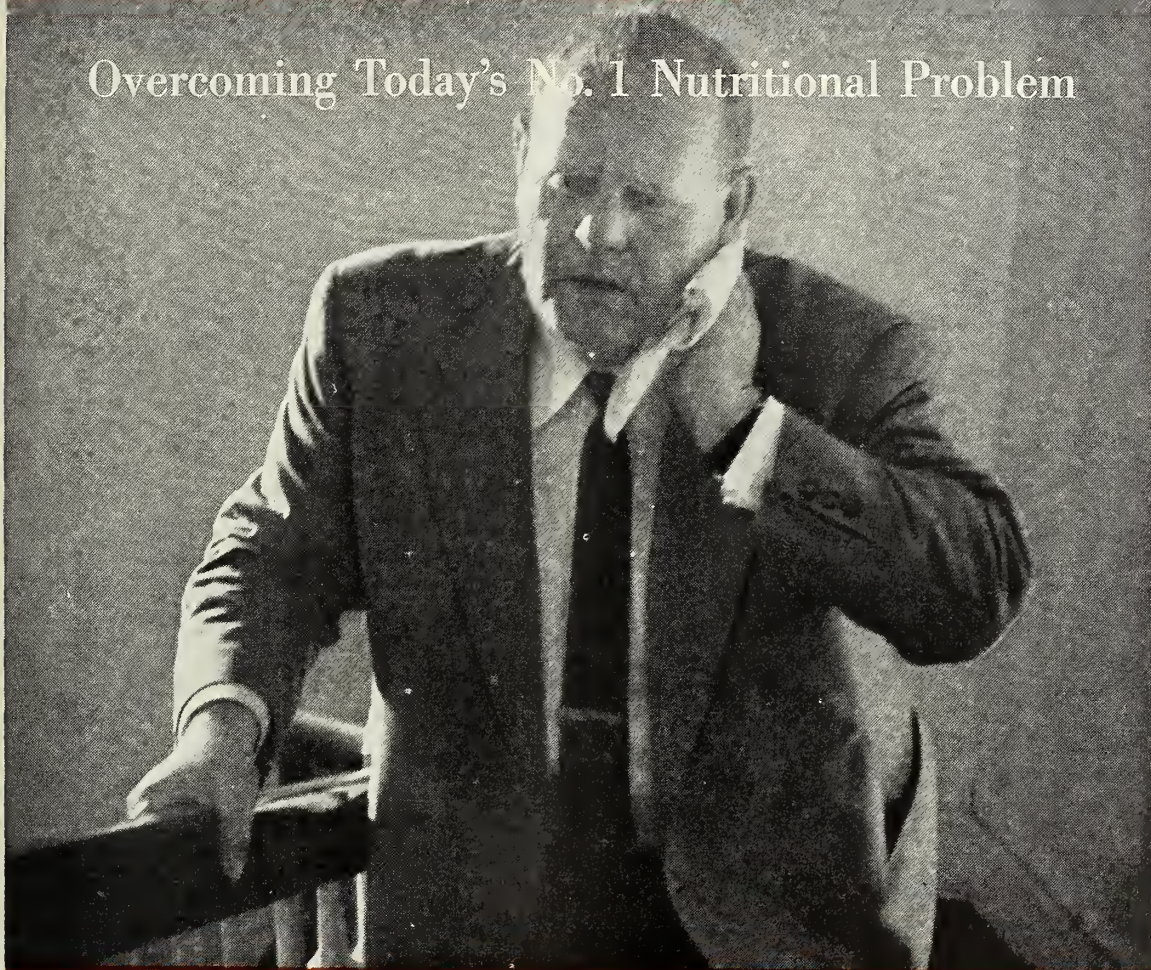
The Committee on Industrial Medicine has been rather inactive this year. There have been no formal complaints by the Compensation Commission and because of political changes there was very little done in medical-industrial relationship.

Correspondence was carried on with the national committee on adopting a roster of examining physicians for the periodical executive physical examination. After considerable contemplation this was dropped on both the national and state levels as being impractical at present.

Winstan L. Anderson, M.D., *Chairman*

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E. X. Crowley, Wichita, Chairman; L. E. Filkin, Concordia; H. M. Floersch, Kansas City; H. M. Foster, Hays; R. G. Heasty, Manhattan; R. L. Hermes, Lawrence; J. S. Menaker, Wichita; R. Sohlberg, Jr., McPherson; D. L. Tappen, Topeka.

This committee approved the standard birth and stillbirth certificates as revised by the Kansas State Board of Health. Members will be informed as to the details of these revised certificates prior to the time they will be put into use.

The committee spent considerable time reviewing maternal deaths in Kansas in 1956. A report of each death is on file in the office of the Kansas Medical Society.

Approval and support of the progress being made on a project of the Kansas Academy of Pediatrics and the Kansas Medical Society Committee on Child Welfare have been expressed by this committee. The project concerns preparation of a pamphlet entitled "Standards for the Care of the Newborn."

E. X. Crowley, M.D., *Chairman*

MEDICAL ASSISTANTS

M. C. Eddy, Hays, Chairman; L. G. Allen, Jr., Kansas City; A. C. Armitage, Hutchinson; R. E. Bula, Lyons; W. P. Callahan, Sr., Wichita; K. J. Gleason, Independence; H. U. Kennedy, Topeka; F. E. Nyberg, Wichita; M. E. Schulz, Russell.

This committee, in collaboration with the Kansas Medical Assistants' Society, this year conducted its second circuit course of seminars designed to accomplish the following goals:

1. Increase the assistant's sense of pride and responsibility in her career as your office assistant.
2. Give her a better insight into the problems of the patient seeking medical care.
3. Promote efficiency in handling the office and in handling accounts.
4. Make your office a more pleasant, efficient place for you and your patients.

This was attended by around 300 of your assistants who showed to us who collaborated in the course a greater insight into the problems of everyday practice and a greater enthusiasm for improving the conditions of private practice than have the doctors.

It is the opinion of your committee chairman that the girls who attended will be better office assistants and that the ones who did not attend are probably the girls who need it the most.

Your chairman also thinks that it is the business of the profession to make it a "must" for his assistant to participate in these meetings.

The Kansas Medical Assistants' Society was the group which initiated an American Association of Medical Assistants which met for the first time in Milwaukee last fall. Kansas girls were elected as president and treasurer of this group. A constitution was adopted, and standing committees were set up for the organization. Their second meeting will be held in October at San Francisco, and your chairman respectfully urges that you provide your assistant the means to attend this meeting as a member of the Kansas delegation.

Your chairman wishes to express his personal thanks to the members of the Kansas Medical Society and to his committee who gave so generously of their time to the seminars and to the general committee work.

Murray C. Eddy, M.D., *Chairman*

MEDICAL ECONOMICS

G. E. Kassebaum, El Dorado, Chairman; G. B. Athy, Columbus; A. H. Baum, Dodge City; J. N. Blank, Hutchinson; G. F. Corrigan, Wichita; O. W. Longwood, Stafford; M. B. Miller, Topeka; J. C. Mitchell, Salina; B. A. Nelson, Manhattan; L. S. Nelson, Jr., Salina; R. T. Parmley, Wichita; F. G. Schenck, Burlingame; C. H. Steele, Kansas City.

The Committee on Medical Economics met at the Lamer Hotel, Salina, on October 14, 1956.

Discussion of the wholesale life insurance program consumed some time, especially on ways and means of expediting same. The committee is enthusiastic over its possibilities and the unusual opportunity presented to the younger members to get adequate insurance at a cost within their means. It is also an unusual opportunity for the un-insurable risk, as well as a bargain for all members.

Mal-practice insurance was next discussed. The pro's and con's of larger policies were thoroughly reviewed, especially in view of some of the excessive judgments being rendered throughout the country. This excess has not been manifest in Kansas as yet. Perhaps the fact that the majority of Kansas doctors carry low limits makes suits less attractive to attorneys seeking such business. It was the consensus that the medical society should not attempt a program of higher limits and that individual doctors who felt themselves vulnerable should seek additional insurance as is available to them through the insurance business.

Some criticism of some of our present health and accident programs was considered, especially in light of some newer policies being brought out by competing companies. Secretary Oliver Ebel was asked

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and "... often useful in the treatment of infections due to staphylococci resistant to one or several of the regularly used antibiotics"

"side effects . . . [are] notable by their absence"¹

1. Carter, C. H., and Maley, M. C.: Antibiotics Annual 1956-1957, New York, Medical Encyclopedia, Inc., 1957, p. 51.

to seek further information and present it to the committee at its next session.

Business interruption insurance was brought to the committee's attention by several companies. The committee could not see where there was any advantage in this particular phase of insurance, as it merely represented another form of loss of income insurance and is pretty well covered by the usual health and accident policies and for a lesser premium.

No changes were recommended in our stand on the welfare program—i.e. each county society deal directly with local commissioners.

Medicare was discussed and the plan was endorsed without enthusiasm. We felt we were helpless to do anything other than help protect a realistic fee schedule.

A standard insurance report blank was accepted and the secretary was advised to proceed with orders. You have since been contacted in this regard.

There seems to be so much misunderstanding and lack of information available on Social Security for doctors that the committee requested Oliver Ebel to arrange for a representative of the Internal Revenue Department and a tax accountant to appear at the next committee meeting. Thus we hope to get some concrete information to present to the profession in the near future so that all may understand and thus make their decisions on the matter.

G. E. Kassebaum, M.D., *Chairman*

MEDICAL PRACTICE ACT

L. R. Pyle, Topeka, Chairman; J. D. Colt, Jr., Manhattan; N. L. Francis, Wichita; J. A. McClure, Topeka; N. E. Melencamp, Dodge City; C. W. Miller, Wichita; L. S. Nelson, Sr., Salina; L. F. Schmaus, Iola; Attorneys for the Society and for the Board.

Since the activities of this committee are well known to most of the members of the House of Delegates, this report will be in the form of a resume of these activities for the benefit of the House of Delegates and the membership.

This committee, after authorization by the House of Delegates at the last annual session to prepare and present a complete Healing Arts Act, has had numerous meetings. It was the desire of the committee to write a model act. The first job was to review all such acts now in force throughout this country and to select those parts which we thought were particularly applicable to us here in Kansas.

This was done, and the first draft of the two acts prepared was sent to the members of the committee for their study. Along in the early fall your committee and the attorneys for the Society and for the Kansas

State Board of Medical Registration and Examination went over the acts with consideration of every clause and sentence. Following this the first revision was made.

In October the first revision was presented to a special meeting of the House of Delegates for suggestions and approval. Certain suggestions were incorporated in the acts and the House of Delegates unanimously passed them and authorized us to proceed with our plan to have them introduced into the 1957 session of the Kansas legislature.

In this preparation copies of the bills were given to the osteopathic profession and to the chiropractic profession.

Selected members of the committee and the Kansas Medical Society met with the responsible members of the osteopathic profession to explain our position with regard to this proposed legislation. They were invited to go over the bills and meet with us again, adding their suggestions.

In early January our president, Dr. Miller, called a meeting of selected members of this committee and of the osteopathic profession to consider these points and to attempt to reach an agreement. Due to the skillful manipulation of our president, aided by excellent discussion from several of our members who were present, the two professions reached a point of agreement with no basic change in the content of the bills as passed by the House of Delegates.

The chiropodists, by their own request, were deleted from the acts since they treat only a small section of the body.

The chiropractic profession was given copies of the bills, and our executive secretary, Oliver Ebel, addressed one of their meetings. Other than that, even though we offered to meet with them again, we have had cooperation.

About the middle of February the acts, after a final review by our attorneys and the attorney of the osteopathic association, were introduced as bills from the Hygiene and Public Health Committee of the House. After the first reading, the bills were referred back to the committee for hearings. The committee held hearings with the chiropractic association, members of which consistently misrepresented the contents of the bills, members of our committee, and a committee from the osteopathic association. They also heard from members of the Board of Medical Registration and Examination.

On February 28 the bills, with minor amendments, were passed out of the committee by a vote of 7 to 2, and on March 1, 1957, they had their second reading in the House. On March 4, 1957, they were placed on the calendar.

Lucien R. Pyle, M.D., *Chairman*

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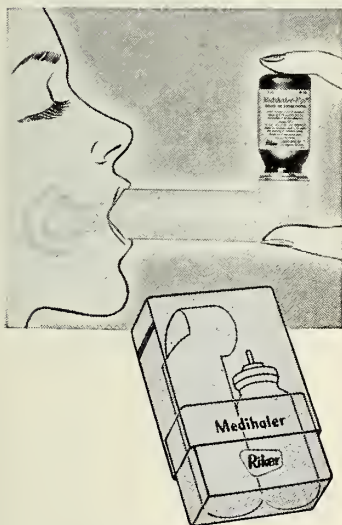
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Tolerance to this combination is good because there is little likelihood of sodium retention, potassium depletion or gastric distress with buffered prednisolone, and meprobamate rarely produces significant side effects in therapeutic dosage.

An additional important therapeutic benefit, often overlooked, stems from the tranquilizing action of meprobamate. This component of MEPROLONE relieves mental tension and anxiety so often manifest in arthritics, making them more amenable to other rehabilitation measures.

INDICATIONS: A wide variety of conditions, in which four symptoms predominate: *a*) inflammation *b*) muscle spasm *c*) anxiety and tension *d*) discomfort and disability; i.e., rheumatoid arthritis, rheumatoid spondylitis (Marie-Strümpell disease), Still's disease, psoriatic arthritis, osteo-

Therapeutic benefits of MEPROLONE compared with traditional therapy

| | relieves pain | suppresses inflammation | relaxes muscle | eases anxiety |
|------------------|---------------|-------------------------|----------------|----------------|
| Salicylates | ✓ | ✓ | | |
| Muscle relaxants | | | ✓ ¹ | |
| Tranquilizers | | | | ✓ ¹ |
| Steroids | ✓ | ✓ | | |
| MEPROLONE | ✓ | ✓ | ✓ | ✓ |

¹ Meprobamate is the only tranquilizer-muscle-relaxant combination.

arthritis, bursitis, synovitis, tenosynovitis, myositis, fibromyositis, neuritis, acute and chronic pain, acute and chronic primary and secondary and torticollis, intractable asthma, respiratory allergic and inflammatory eye and skin disorders, tenancy therapy in disseminated lupus erythematosus, periarteritis nodosa, dermatomyositis and scleroderma.

SUPPLIED: Multiple Compressed Tablets in 100 in two formulas as follows: MEPROLONE-1 of prednisolone, 200 mg. of meprobamate and dried aluminum hydroxide gel. MEPROLONE-2 2.0 mg. of prednisolone in the same formula.

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MEDICAL SCHOOLS

R. W. Fernie, Hutchinson, Chairman; R. G. Ball, Manhattan; M. E. Christmann, Pratt; E. W. Crow, Wichita; O. W. Davidson, Kansas City; N. M. Jenkins, Salina; L. C. Joslin, Harper; D. Marchbanks, Hill City; B. P. Meeker, Wichita.

A major portion of the work of this committee depends upon the outcome of certain bills in the current Kansas legislature. This committee, therefore, will meet after the close of the legislature and before the session of the House of Delegates. We beg leave to make a supplementary report at the time of the meeting of the House of Delegates.

R. W. Fernie, M.D., *Chairman*

MENTAL HEALTH

W. F. Roth, Jr., Kansas City, Chairman; A. J. Adams, Wichita; H. V. Bair, Parsons; A. P. Bay, Topeka; O. R. Cram, Jr., Larned; J. A. Dunagin, Topeka; D. B. Foster, Topeka; T. L. Foster, Halstead; M. T. Glassen, Phillipsburg; E. D. Greenwood, Topeka; L. W. Hatton, Salina; T. R. Hood, Topeka; G. W. Jackson, Topeka; P. C. Laybourne, Jr., Kansas City; R. A. Moon, Prairie Village; R. F. Schneider, Kansas City; D. R. Wall, Wichita; E. M. Wright, Lawrence.

While retaining the same general objectives pursued by the committee in previous years (i.e. better treatment of the mentally ill in Kansas and promotion of better mental health through educational activities), the committee focused its attention, during the current year, on efforts to improve the Kansas laws pertaining to the care of the mentally ill.

The full committee met only twice during the year, but Dr. Jack Dunagin's Sub-Committee on Legislation held several meetings, conferred with legislators in Topeka, and met with members of other groups in the state for the purpose of conveying to these people the interest of the Society in medically sound legislation, and to offer the services of the committee as a professional group prepared and willing to give medical or special psychiatric advice regarding proposed legislation, upon request.

The scope and functioning of Dr. Mary Glassen's Sub-Committee on Mental Health Education was broadened by the addition of a member in each of the largest population centers (Wichita, Topeka, Kansas City), to whom was assigned the responsibility of expediting the supply of speakers on mental health topics, when requests for such speakers come in from medical societies.

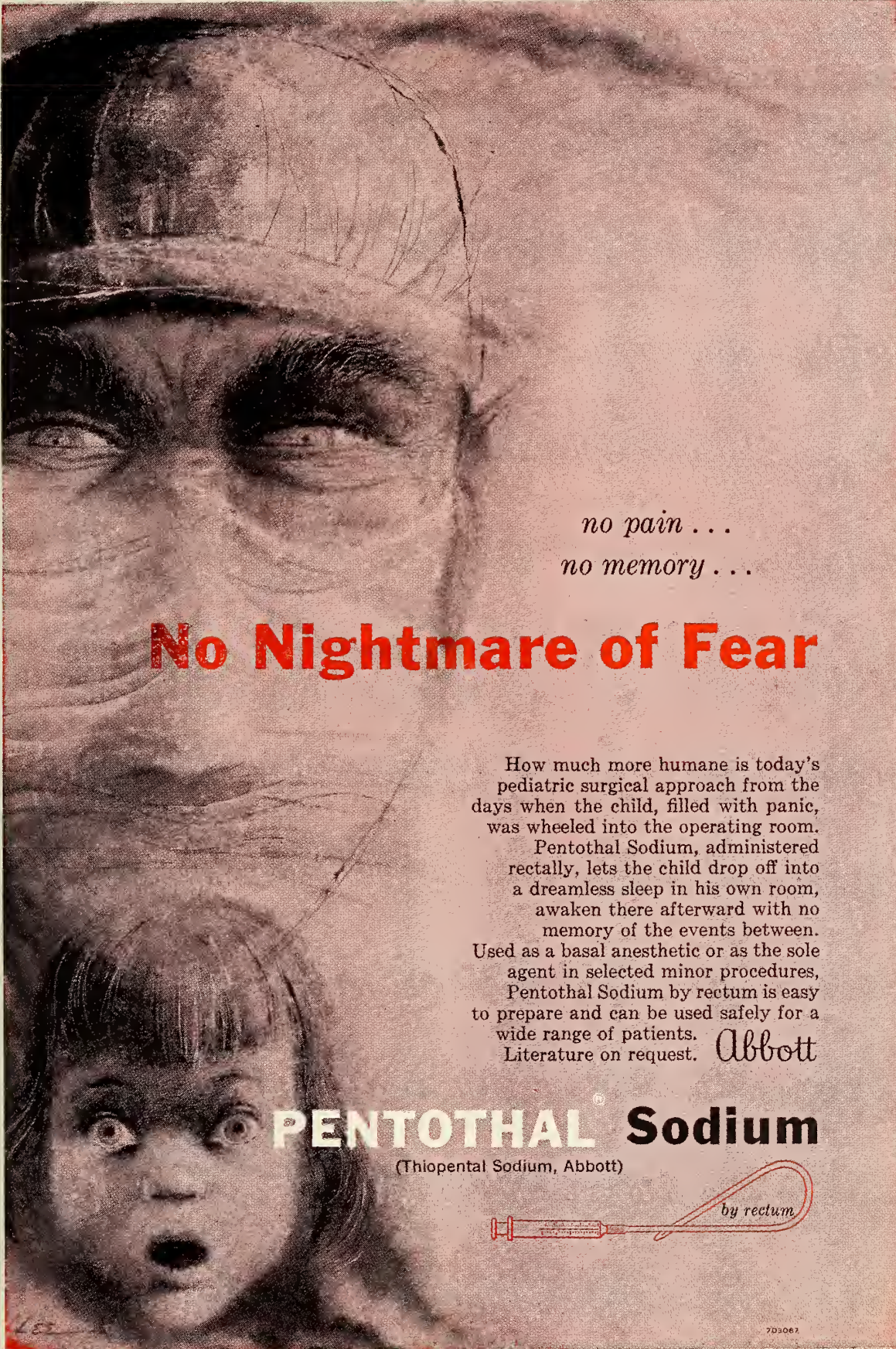
WILLIAM F. ROTH, JR., M.D., *Chairman*

NECROLOGY

O. R. Clark, Topeka, Chairman; D. E. Gray, Topeka; R. Greer, Topeka; D. Lawson, Topeka; J. A. Segerson, Topeka.

The Committee on Necrology submits the following list of members of the Kansas Medical Society whose deaths have been reported since the last meeting of the House of Delegates:

| <i>Name and Address</i> | <i>Age</i> | <i>Date</i> <i>1956</i> |
|---|------------|----------------------------|
| Dr. Maurice S. Wessell, Burlington | 54 | Mar. 25 |
| Dr. Estella Edwards Conover, Bethesda, Maryland | 74 | Apr. 28 |
| Dr. James Branson Weaver, Kansas City | 58 | Apr. 30 |
| Dr. Stanley Glen Laing, Kansas City | 55 | May 26 |
| Dr. Dale E. Clark, Cedar Vale | 36 | June 4 |
| Dr. Clay Ephraim Coburn, Kansas City | 83 | June 8 |
| Dr. Harry Roswell Wahl, Kansas City | 69 | June 18 |
| Dr. William Frederick Schoor, Hutchinson | 79 | June 22 |
| Dr. Mervin Tuban Sudler, Lawrence | 80 | June 22 |
| Dr. Ralph Bowman Earp, El Dorado | 81 | June 25 |
| Dr. Alfred O'Donnell, Ellsworth | 83 | June 26 |
| Dr. Robert A. J. Shelley, Coldwater | 81 | July 3 |
| Dr. Ralph Ensign Jordan, Emporia | 39 | July 11 |
| Dr. Walter Etna McKinley, Gardner | 88 | July 19 |
| Dr. John Merritt McGrew, Wellington | 56 | July 25 |
| Dr. Donald L. Williams, Garden City | 32 | July 25 |
| Dr. Ione S. Clayton, Arkansas City | 71 | Sept. 16 |
| Dr. Samuel Glick Ashley, Chanute | 74 | Sept. 17 |
| Dr. Albert Newton Gray, Burlington | 86 | Sept. 20 |
| Dr. George William Bertram, Beverley, Topeka | 84 | Sept. 24 |
| Dr. Perry Marshall Bell, Wichita | 67 | Oct. 3 |
| Dr. George E. Brethour, Dwight | 72 | Oct. 27 |
| Dr. Frederick William O'Donnell, Junction City | 60 | Nov. 6 |
| Dr. James Henry Dittmore, Belleville | 82 | Nov. 20 |
| Dr. Peter Frank Theis, Wichita | 71 | Dec. 19 |
| | | 1957 |
| Dr. Oscar L. Erickson, Topeka | 68 | Jan. 4 |
| Dr. Harvey Elijah Van Noy, Lawrence | 76 | Jan. 13 |
| Dr. Henry Edgar Haskins, Kingman | 78 | Feb. 1 |
| Dr. Lindley Edgar Strode, Girard | 84 | Feb. 27 |
| Dr. Karl C. Haas, Kansas City | 70 | Mar. 13 |
| Dr. Mark L. Bishoff, Topeka | 89 | Mar. 19 |
| Dr. Eugene K. Hawk, Wichita | 35 | Mar. 23 |
| <i>Orville R. Clark, M.D., Chairman</i> | | |



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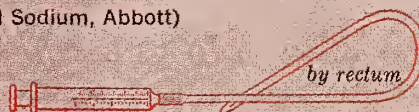
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PATHOLOGY

B. E. Stofer, Wichita, Chairman; A. A. Fink, Topeka; T. R. Hamilton, Kansas City; C. A. Hellwig, Halstead; C. J. Weber, Salina.

The Committee on Pathology of the Kansas Medical Society met January 27, 1957. The proposed bill for licensing of medical technicians was discussed. It was opposed on the basis of lowering standards, placing control in the hands of a state board, and being contrary to policies previously adopted and accepted. These opinions were forwarded to the executive secretary and on to the Legislative Committee.

Bert E. Stofer, M.D., *Chairman*

POSTGRADUATE STUDY

E. L. Mills, Wichita, Chairman; W. H. Algie, Kansas City; G. E. Burket, Jr., Kingman; M. F. Delp, Kansas City; D. Lawson, Topeka.

The committee has continued to take part in the postgraduate medical education program of the University of Kansas Medical School and the Medical Center.

Certainly the medical school has maintained high standards of medical instruction—not only for the physicians practicing in Kansas, but also from many states in this part of the country. The high percentage of practicing physicians in Kansas who have taken postgraduate medical instruction through the courses offered at the Medical Center, by circuit courses or correspondence courses, has increased. Kansas stands very high in this regard.

The combined yearly meeting of the Postgraduate Division of the Medical Center, the Kansas Medical Society, and the Kansas State Board of Health continues in March of each year and all aspects of postgraduate medical education are discussed.

Earl L. Mills, M.D., *Chairman*

PUBLIC RELATIONS

D. E. Gray, Topeka, Chairman; A. L. Ashmore, Wichita; N. L. Francis, Wichita; C. C. Gunter, Quinter; J. D. McMillion, Coffeyville; J. W. Manley, Kansas City; V. R. Moorman, Hutchinson; E. Myers, Iola; J. G. Phipps, Wichita; C. O. Stensaas, Arkansas City; V. E. Wilson, Kansas City.

Political and legislative activity in the public interest narrowed the sphere of this committee's work during the past year. Ordinarily public relations concerns that somewhat vague effort which is hopefully designed toward creating peace on earth and good

will toward men—especially in this instance toward the men who practice medicine.

If of more closely defined margins, the committee this year has at least had a more clearly recognized objective than sometimes, which was to raise the minimum level of health care in this state. If this did not entirely fall under the usual formulas of such efforts, it was at least more practical.

Your committee was only one segment of many individuals and groups who exerted an influence upon the legislature in behalf of sound public health laws, but such activity was among the most important work of the year.

As a second project members of the committee served as instructors in the medical assistants' education program held in various cities over the state. They discussed the function of the medical assistant in public relations, both in the office and in the community.

A third project recommended by the president was to prepare a public information program designed to cause all persons under 40 years of age to have at least two poliomyelitis immunizations before summer. This committee is prepared to recommend that each county society establish a set program to fit its own needs but which shall cover the average fee to be charged and which shall set out some plan whereby this immunization may be obtained at no cost for those unable to pay.

Your committee proposes no prototype for these two points but recommends that each society immediately establish a policy on both suggestions. This committee would then publicize the program on a statewide basis. This project was postponed by request from the A.M.A., but perhaps a supplementary report at the House of Delegates meeting may add details that are not available at the time of this writing.

David E. Gray, M.D., *Chairman*

RURAL HEALTH

V. E. Brown, Sabetha, Chairman; H. L. Bogan, Baxter Springs; M. F. Frederick, Hugoton; R. E. Grene, La Crosse; H. W. Hiesterman, Quinter; F. Law, Bird City; R. M. Owensby, Mankato; L. W. Patzkowsky, Kiowa; E. B. Scagnelli, Dodge City; R. R. Snook, McLough; E. F. Steichen, Lenora; C. R. Svoboda, Chapman; M. H. Waldorf, Jr., Greensburg; T. L. Wayland, Nashville; H. O. Williams, Cheney; E. D. Yoder, Denton.

In addition to formal meetings held by this committee, several subcommittee meetings were arranged in preparation for the National Conference on Rural Health which is to be held in Wichita in 1959. Com-



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mittee members met with representatives of the American Medical Association to point out advantages of holding the conference in Kansas.

The committee is making a concerted effort to work with various farm organizations such as the Farm Bureau, Grange, and branches of the agricultural school at Kansas State College.

In addition to representing the Kansas Medical Society at a conference on rural health at Purdue University, your chairman also attended the National Conference on Rural Health at Louisville, Kentucky.

In the coming year the committee hopes to have formal meetings with various farm organizations of Kansas and with representatives of the farm press in an effort to extend our rural health public relations program and to make additional plans for the 1959 meeting. Distribution of doctors will also be a problem of concern to this committee.

The shift of population from rural to "rurban" (suburb) areas is creating many problems of which this committee is aware. We ask that the committee which follows this one take this shift of population into consideration in its planning.

V. E. Brown, M.D., *Chairman*

SAFETY

J. A. Grove, Newton, Chairman; C. M. Barnes, Seneca; F. C. Beelman, Topeka; A. E. Hiebert, Wichita; H. E. Snyder, Winfield.

The Committee on Safety was formed late in 1956 through action of the Council. The purpose of the committee, briefly, is to work with a President's Committee on Traffic Safety as well as related organizations in the state of Kansas which are trying to combat the serious problem of highway accidents.

The secondary objectives of the committee are not limited to traffic safety alone but to formulation of plans to include any other worthwhile aspects of public safety.

No formal meetings of the committee have been held at the time of this report. Two of the members of the committee, H. E. Snyder, M.D., Winfield, and John A. Grove, M.D., Newton, are members of the Kansas Citizens Safety Council which, during the past year, has been active in promoting a five-point program for legislative enactment to secure speed limits on Kansas highways, overhaul the Kansas traffic laws and bring them into conformity with the National Traffic Code, increase the number of men available for the Highway Patrol System of the state, study and re-write the Drivers Licensure Law of the state, which is badly in need of revision and bringing-up-to-date, urge the adaptation of driver's training throughout the state, and other specific objectives

to help reduce the advancing number of highway accidents and fatalities.

It is anticipated that this committee in the following years will prove to be of inestimable value to the Society with unlimited opportunities for the type of work benefiting both the public and the profession.

John A. Grove, M.D., *Chairman*

SCHOOL HEALTH

C. M. Barnes, Seneca, Chairman; W. F. Bernstorff, Winfield; J. A. Butin, Chanute; W. H. Crouch, Topeka; D. B. Foster, Topeka; E. D. Greenwood, Topeka; L. E. Haughey, Concordia; H. P. Jubelt, Manhattan; P. C. Laybourne, Kansas City; H. Lutz, Augusta; W. C. Menninger, Topeka; F. D. Murphy, Lawrence; R. R. Snook, McLough; L. N. Speer, Kansas City.

This committee had several meetings during the past year and is making several recommendations in regard to statewide school health programs.

The committee unanimously recommends that each county medical society appoint a school health committee in an effort to solve its local problems and in addition to cooperate with this committee to coordinate the state program.

Plans have been made for the preparation of five scientific papers on various phases of school health. These are to be submitted to the Editorial Board of the JOURNAL, and it is hoped that the material submitted will justify publication of a special issue of the JOURNAL devoted entirely to the subject of school health.

The committee is preparing an exhibit for the 1957 annual session of the Kansas Medical Society. It has also planned publication of a pamphlet containing instructional information to county societies on the problems of school health.

Conrad M. Barnes, M.D., *Chairman*

STORMONT MEDICAL LIBRARY

W. Mau, Topeka, Chairman; M. D. Morris, Topeka; N. V. Treger, Topeka.

Most of the work of this committee consists of a routine visit with the librarian and a discussion of library problems. The committee has visited at the library during the course of the year.

A more urgent problem, however, is the fact that the legislature has a bill, the outcome of which is not determined at this time, which will move the Stormont Medical Library from the third floor to the fifth floor of the state house. This, it appears, is not

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in the best interests of the library. The outcome will be reported at the time of our annual session.

Walter Mau, M.D., *Chairman*

STUDY OF HEART DISEASE

G. L. Norris, Winfield, Chairman; D. R. Bedford, Topeka; E. G. Dimond, Kansas City; C. W. Erickson, Pittsburg; L. H. Leger, Kansas City; P. W. Morgan, Emporia; L. O. E. Peckenschneider, Halstead; M. Snyder, Salina; D. C. Wakeman, Topeka; G. B. Wood, Wichita.

This committee held no meetings during the past year. The only action taken was approval given by letter to the work of the Kansas Chapter of the American Heart Association.

G. L. Norris, M.D., *Chairman*

VENEREAL DISEASE

H. W. Lane, Kansas City, Chairman; M. L. Bauman, Wichita; A. B. Harrison, Wichita; C. H. Murphy, Topeka; L. C. Murphy, Wichita.

The Venereal Disease Committee of the Kansas Medical Society met in Wichita on February 26, 1957,

and approved the following items for action by the Kansas Medical Society:

1. That the Kansas Medical Society recommend that the Kansas State Board of Health, through its Division of Public Health Laboratories, perform quantitative examination of all bloods submitted for a test for syphilis which have been found by qualitative examination to be reactive or weakly reactive.

2. That the Kansas State Board of Health, the Kansas Medical Society, and the University of Kansas cooperate in making available to the physicians of Kansas a refresher course in the various aspects of venereal disease, preferably through the use of the circuit course.

3. That the booklets published in 1955 and 1956 by the Venereal Disease Committee of the Kansas Medical Society and the Kansas State Board of Health be continued with a publication in 1957.

4. That private and hospital laboratories throughout the state of Kansas furnish a duplicate of all laboratory reports of reactive or weakly reactive serological tests for syphilis to the Kansas State Board of Health, provided that the Kansas State Board of Health shall use these reports, after a reasonable length of time, to query physicians regarding the disease status of the patient. Any contact with the patient will be had after approval by the physician.

M. Leon Bauman, M.D., *Acting Chairman*

Special Reports

Activities of Affiliated Groups and Committees

BLUE SHIELD

The year of 1956 has been a progressive one for Kansas Physicians' Service. The most significant advance was the action taken at the 1956 House of Delegates meeting of the Kansas Medical Society authorizing Blue Shield to offer the \$4,500 income plan to the people of Kansas. This plan was finalized and put in contract form, cleared through the State Commissioner of Insurance, and has been offered to the public since January 1, 1957. It has had good acceptance in certain areas, but it is too early to tell how many of those now holding the \$3,000 plan will continue to change to the new plan as their group enrollment dates come due. This was a progressive step by the medical profession in the best interests of the people of Kansas.

In spite of a rate increase in Blue Cross and the effect this has on Blue Shield because of the relation-

ship between the two plans, we have a net increase of 23,794 members in Blue Shield which brings our total membership to 459,208 as compared to 435,414 a year ago. Our cancellation rate is well under that of the national level, and we feel that if we can continue to improve the efficiency of our plan we can reduce the rate of cancellation to a minimum.

The national trend of Blue Shield plans was for increased use of services. There was also increased utilization in Kansas. This fact, together with increased benefits, accounted for a slight financial loss in the basic contract. The contribution to reserve in 1954 was \$502,614.00 (11.81 per cent) and in 1955 \$660,271.00 (13.53 per cent). Because of this trend, many changes were made during the past year. These changes amounted to an added return to the members in the form of increased payments to doctors in the amount of over \$300,000. These changes helped to account for the changed picture at the end of 1956.

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The contribution to reserve was \$165,302.00 (3.01 per cent).

We will need to seriously study the question of surgical assistants as well as the problem created when one physician performs the surgery and another performs the preoperative and postoperative care. There are several other areas which need careful study. For example, how well does the Intensive Medical Care provision solve the problem of short-term hospitalization? What can be done in the coverage of consultations, diagnostic evaluations, and home and office care?

With the help and cooperation of the Kansas Radiological Society we have established a set of x-ray riders which provide diagnostic x-ray coverage to those groups desiring this additional benefit. The early response to the new benefit confirms our estimate of the need for this type of service.

We are happy the Kansas Medical Society saw fit to choose Kansas Physicians' Service as the fiscal agent of the Medicare Program, which gives us added opportunity to cooperate more with the Kansas Medical Society. Blue Shield is pleased that there is increased mutual understanding and cooperation between the Kansas Medical Society and those of us in Blue Shield whom you have chosen to administer your prepayment health plan.

For some time Blue Shield has felt the need of a liaison committee with whom it could work in each specialty group. During the past year we are glad that most of the specialties have appointed committees to represent them in working with Blue Shield. We feel that in this way it will be possible for Blue Shield to get recommendations from these liaison committees which will more nearly represent the general viewpoint of the entire specialty.

We wish to take this opportunity to thank the committees of the Kansas Medical Society, especially the Committee on Blue Shield Fee Schedule and the Committee on Blue Shield Relations, as well as many other individuals who have served with the Blue Shield board in helping to work towards our common goal. This goal is to have the best plan of prepayment of medical service for the people with an adequate return to the doctor who renders these services. With your continuing help, guidance, and patience the doctors in Kansas will continue to be leaders in the field of prepayment medicine as we have been in many other fields in the past.

Francis T. Collins, M.D., *President*

DUES AND HARDSHIPS

J. L. Lattimore, Topeka, Chairman; J. L. Jenson, Colby; H. P. Palmer, Scott City.

This special committee was set up a few months ago to make a study of and recommendations about special hardship cases, especially as applied to failure of a member of our Society to leave his family even moderate protection.

We recognize the problem and wish that we could think of some practical way to remedy this problem, but we feel that any over-all rule on this subject would not accomplish what we had in mind.

We do recommend that any councilor, where he knows of special financial hardship in the surviving family of a physician, that he recommend to the Council of the Society that they refund to the physician's family the dues he may have paid during that current year.

We also recommend two other procedures:

1. That each year at our Society day at the medical school, some time be devoted to explaining to our seniors at Kansas University Medical School their obligation to their wives and families and the necessity to amply protect them with insurance during their early years of practice and before they have had opportunity to accumulate ample protective funds.

2. That the central office of the Society, along with any members that you might select, make a study to supply each incoming young physician in the state of Kansas with a packet. And among the materials contained within, there will be some material dealing with this problem of ample protection of the young physician's family.

Other materials could deal with such subjects as (A) the narcotic license; (B) Society membership and responsibility; (C) a planned scheme for post-graduate work; (D) relationships with fellow physicians. Actually one can go to no end in thinking of the many things that we would like to discuss with these young physicians.

Since we feel that there is no other function for this committee, we request dismissal as a committee.

J. L. Lattimore, M.D., *Chairman*

MEDICARE PROGRAM

L. S. Nelson, Sr., Salina, Chairman, surgery; E. X. Crowley, Wichita, obstetrics; G. B. Joyce, Topeka, orthopedics; C. W. Miller, Wichita, general practice; C. J. W. Wilen, Manhattan, internal medicine.

This committee has held one meeting, at which time 11 disputed claims were reviewed. The purpose of this committee is to serve in a liaison capacity between the fiscal agent, the United States government, and the practicing physician. This committee is given the responsibility of reviewing any claims that appear to be unusual or which the fiscal admin-

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istrator cannot immediately solve from the fee schedule.

The committee wishes to report that the physicians appear to be cooperating with this program and that the services are being performed satisfactorily. At present there appears to be no problem. Should anything further develop between the time of this writing and the House of Delegates meeting, your chairman begs leave to present a supplementary report.

L. S. Nelson, M.D., *Chairman*

BOOK REVIEWS

The Philosophy of Medicine. By William R. Laird, M.D. Published by Education Foundation of West Virginia, Inc., Charleston. 64 pages. Price \$3.00.

This slender volume of 61 pages by Dr. William R. Laird, an eminent surgeon of Montgomery, West Virginia, contains the thoughts, reflections, and philosophy which, for many years, have guided him as physician and teacher. It is his contention that the physician, no matter how wide his medical knowledge or faultless his technique, is sterile without a coexistent philosophy and humanity of approach.—N.U.

Allergic Dermatoses. Edited by Rudolph L. Baer, M.D. Published by J. B. Lippincott Company, Philadelphia. 110 pages. Price \$3.00.

This collection of articles deals with cutaneous hypersensitiveness to physical agents. The field is well covered, dealing with hypersensitivity to trauma, light, heat and cold, but not exhaustively so. Bibliographies are complete.

These are unusual biologic phenomena, but physicians are usually intrigued by them. This little book offers descriptions and theoretical pathogenesis, and it discusses the theoretical importance of these hypersensitive reactions.—C.M.L., Jr.

The Patient Speaks. By Harold A. Abramson, M.D. Published by Vantage Press, Inc., New York. 239 pages. Price \$3.50.

Dr. Abramson is chief of the Allergy Clinic, Mount Sinai Hospital, New York City. Primarily an allergist, he has profoundly added to his understanding of allergic illnesses and to his armamentarium in treating these illnesses by studying psychoanalytic theory and learning psychoanalytically oriented treat-

ment techniques. The book is primarily a condensation of the prolonged psychoanalytic treatment of one woman patient who suffered from lifelong severe eczema and who recovered with this treatment. It deals, principally, with "the patient's psychological struggle to reorient a distorted relationship with her mother."

Most of the book is made up of verbatim excerpts from recorded interviews, with brief summaries by the author identifying the major problems discussed in any one session. At the end of the book are appended some general theoretical comments plus further clinical material.

It takes a trained and sensitive ear to hear all that the patient is saying in her treatment hours, but by judicious italicizing and summary comments, Dr. Abramson does his best to help the reader. It makes fascinating reading and is an important contribution to research in psychotherapy and in the allergies. I believe that it can also add to the practical understanding and skill of all those who treat allergic patients.—P.W.T.

Drugs in Current Use, 1957. Edited by Walter Modell, M.D. Published by Springer Publishing Company, Inc., New York City. 152 pages. Price \$2.00

This is a publication that is revised each year to list alphabetically all drugs that are currently being used, to provide a statement of the principal pharmacologic characteristics of drugs in current use, to describe their actions, administration, dosage, etc.

A review is difficult in that no two persons would decide on the same inclusions and rejections for the list. Some, however, would be manifestly more capable of making such decisions than others, and in this instance the name of the author lends authority to the text. Dr. Modell, associate professor of clinical pharmacology at Cornell University Medical College, knows whereof he speaks.

The book will be a valuable addition to any physician's bookshelf. In this day of multiple drugs, with many new ones having been added during the course of the past year, a reference book such as this is necessary for any who keep up to date on such matters.—P.L.F.

Current Therapy 1957. Latest Approved Methods of Treatment for the Practicing Physician. By Howard F. Conn. Published by W. B. Saunders Company, Philadelphia. 731 pages. Price \$11.

Current Therapy 1957 continues to reflect the fine editorial craftsmanship which has distinguished the previous eight volumes of this annual series. The

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swift pace set by advances in the field of therapeutics and the many new drugs and procedures create a problem for the busy practitioner anxious to keep up with current progress in treatment. This work fills his needs admirably.

A few new names have been added to the list of contributors, and with few exceptions the articles are presented with the concise and lucid writing which have characterized previous editions. In those instances where controversy or differences of opinion exist, Dr. Conn has followed the custom of giving us the opinion of more than one contributor. In addition to an excellent index, the appendix contains a fairly complete listing and description of new drugs.—N.U.

Dorland's Illustrated Medical Dictionary, 23rd Edition. Edited by Leslie Brainerd Arey, Ph.D., Sc.D., LL.D.; William Burrows, Ph.D.; J. P. Greenhill, M.D., and Richard M. Hewitt, A.M., M.D. Published by W. B. Saunders Company, Philadelphia. 1598 pages, 700 illustrations, 50 plates. Price \$12.50.

A person asked to evaluate Sterling silver, assuming that all are familiar with the Sterling standard of quality, would confine his remarks to the pattern and the designer. One asked to review a Dorland dictionary, realizing that the Dorland name also denotes quality, can discuss the book's format and its contributors.

This new edition is bound in the familiar red cover. It is thumb indexed, a feature that is appreciated by the thousands who refer to Dorland's daily for authentic and concise information on definitions, pronunciations, spelling, etymology, and abbreviations for the multitude of terms used today in the practice of medicine and the understanding of its literature. The type faces are simple and provide easy reference.

Members of the Editorial Board listed above were assisted by four major consultants and 72 other contributors, each an authority in a specific field.

This edition will enjoy, as have its 22 predecessors, the approval of all who have occasion to use a medical dictionary.—P.F.

Accidents rank fourth among the leading causes of death in Kansas, according to the Kansas State Board of Health. Motor vehicle accidents continue to take the largest number of lives, accounting for 614 deaths in 1955. Most fatal accidents occurred during daylight hours, on clear days, when driving conditions were at their best. Typical causes include excessive speed, reckless or sleepy drivers, faulty brakes, and worn and smooth tires, but the most important cause was human failure.

Medical Services

(Continued from Page 225)

sicians in Kansas has almost doubled since 1948, compared with the post-war years 1942-47. There are variations in the rate of increase, the variations being associated with density of physicians' services.

This study will be continued to consider the relative distribution of the services of specialists and general practitioners.

University of Kansas Medical Center
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The interest of the public in health matters is demonstrated by records kept during the first three months of this year by Dr. Theodore Van Dellen, who conducts the "How To Keep Well" column in the *Chicago Tribune*. During that period he received 54,000 letters about health matters from readers, and about one-third of the total required personal answers. Twenty-one such columns are syndicated to newspapers throughout the country.

In addition to conducting the column, Dr. Van Dellen is assistant dean and associate professor of medicine at Northwestern Medical School and serves on six committees of the Illinois and Chicago medical societies.

More than 5,000 foreign physicians came to this country for study during the year 1954-1955, according to a recent A.M.A. report. They represented 83 different countries and studied in 42 different states. More than 2,000 were in the United States on their own resources. Others were sponsored by 67 different agencies, including their own or the United States government, the United Nations, and religious, educational, or philanthropic organizations. In comparison, only 3.6 per cent of all American educators visiting other parts of the world in 1954-1955 were listed under medicine.

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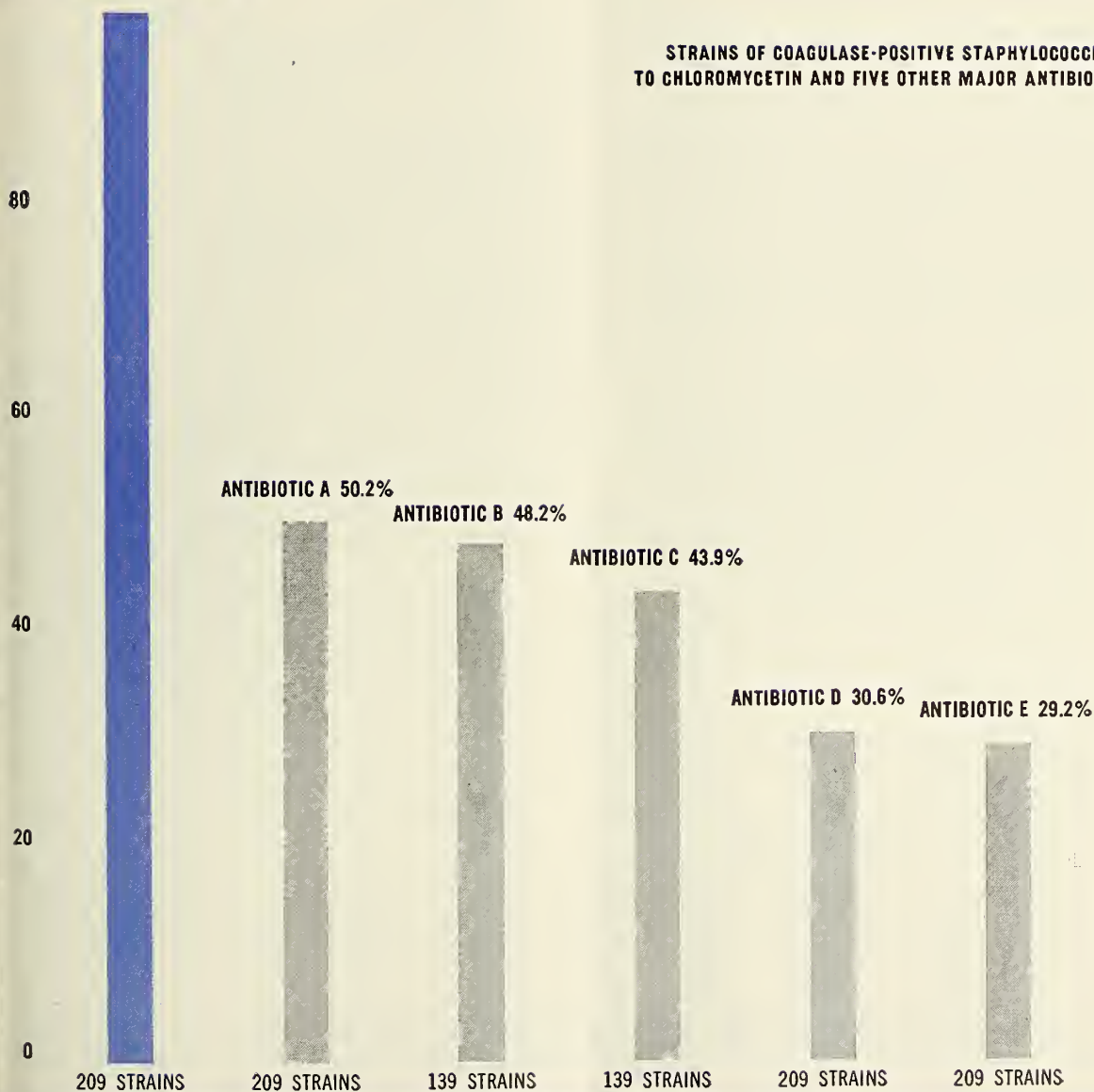
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*This graph is adapted from Spink.²

THE JOURNAL of the KANSAS MEDICAL SOCIETY

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MAY, 1957

Number 5

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No. 5

Myotonia

Report of a Case in Transition between Myotonia Congenita and Myotonia Dystrophica

HARRY H. WHITE and CHARLES M. POSER, M.D., *Kansas City*

Since 1886, when Erb¹ wrote his classic description of the myotonic reaction, a number of disease entities have been delineated which have as their distinguishing feature a myotonic reaction of various muscle groups. Three main diseases of this type have been recognized: myotonia dystrophica of Steinert,^{1a} myotonia congenita of Thomsen^{1b} and paramyotonia of Eulenberg.^{1c}

Myotonia dystrophica (Steinert's disease) is also characterized by what seem to be endocrinopathic features such as frontal baldness, testicular atrophy, and cataracts, while in myotonia congenita (Thomsen's disease) there is hypertrophy of muscles. Although it is well known that any type of myotonia will be aggravated by cold, Eulenberg's paramyotonia has as its only characteristic a myotonic reaction produced by cold.

Certain neurologists, however, have been reluctant to separate the three entities, and evidence has been brought forward to support the contention that they are merely variant manifestations of a single disease process. The transitional cases reported in the literature reinforce this view.

The purpose of this paper is to report a case that is felt to represent a transitional stage between myotonia dystrophica of Steinert and myotonia congenita of Thomsen.

Case Report

W. M., a 35-year-old salesman, first entered a naval hospital in California in February, 1944, with

From the Section of Neurology, Department of Medicine, University of Kansas School of Medicine, Kansas City. Mr. White is a junior in the School of Medicine, and Dr. Poser is an instructor in medicine at the school.

the complaint of "stiffness" of the body and progressive enlargement of the calf muscles for a month. While riding on a train, he had attempted to rise from his seat. He found he was unable to straighten out, and his muscles had become "stiff." He said he had had transitory episodes of stiffness for the past two years, and that he was unable to run unless he

In the case reported myotonia congenita is suggested by the presence of hypertrophy of the calf muscles. The diagnosis of myotonia dystrophica is indicated by small sternomastoids, cataracts, distribution of the myotonia, generalized weakness, and decreased urinary 17-ketosteroids. Long-term abolition of the myotonic reaction through the use of cortisone and prednisone is reported.

began by walking slowly and then gradually increasing his speed. He had noticed that he had difficulty in taking hold of things until after his fingers were "worked a while," at which time "full power comes to them." He felt his condition was more severe during cool weather.

Physical examination revealed enlargement of the calf muscles of both legs. No mention was made of myotonic contractions. The rest of the physical examination was negative. The diagnosis of myotonia (etiology undetermined) was made. The patient received 5 grains of quinine three times a day for a period of two days with no subjective improvement,

and he then was dismissed to return to active military duty.

The patient re-entered the same hospital in March, 1944, with the same complaints. His symptoms had progressed to a degree that he was handicapped in performance of his duties. A biopsy of his gastrocnemius muscle showed muscle fibers which were thicker than normal, many areas in which the longitudinal fibrils could not be distinguished, an increase in the number of sarcolemmal nuclei, preservation of cross striations, no fatty changes, and one area disclosing a small collection of lymphocytes. The pathological diagnosis of the biopsy specimen was "changes compatible with myotonia congenita."

After his case was reviewed he was given a medical discharge in May, 1944. Shortly thereafter he noted occasional difficulty in opening his clenched fist.

From 1944 to 1951 there were no subjective changes in his condition. From 1951 to 1956 he noticed increasing weakness in carrying out his normal business activities, and in June of 1956 he entered the hospital with a complaint of "stiffness" of his muscles.

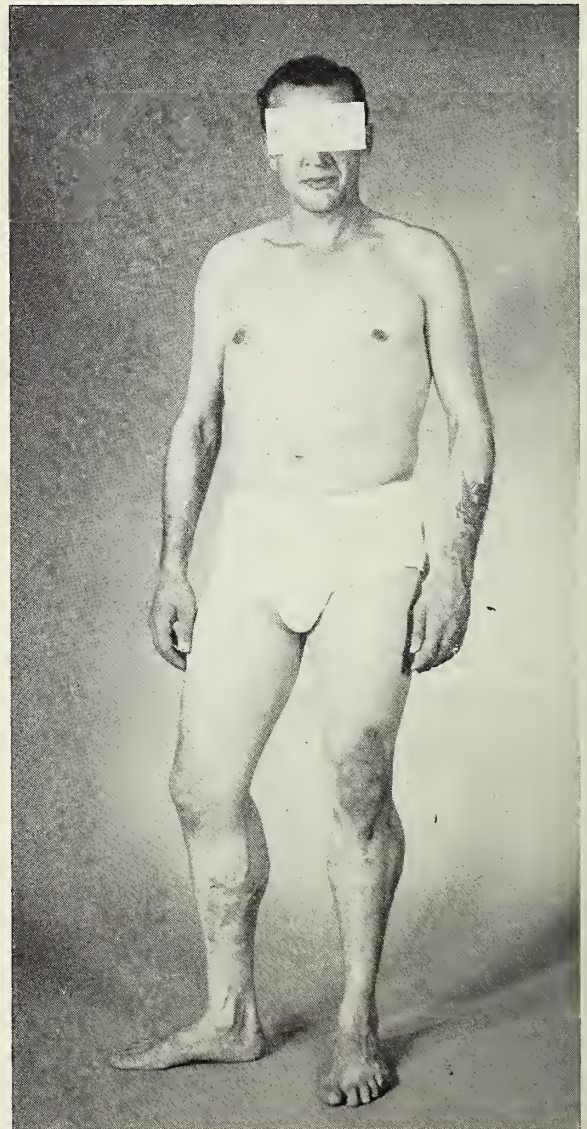
The family history was as follows: The patient's father died at 55 of cancer of the liver, and his mother died at 58 of heart trouble. The patient's father had one brother who died of a stroke and two sisters, one of whom died of unknown causes; the other is living and well. His mother had two sisters and one brother, all living and well. The patient had had four siblings, all dead. One brother died at 6½ of blood poisoning; one sister died at 28 in childbirth; one sister died at 17 of a head injury, and another sister died at 24 of an internal hemorrhage. There was no family history of early baldness, cataracts, sterility, or other endocrine dysfunction. The patient had two children, ages 6 and 11, by his first wife, both living and well. He married a second time in 1954 and had thus far been unsuccessful in attempts to have children with this wife.

On neurologic examination the patient was seen to be a well-developed, well-nourished white male with no frontal baldness and facies not strikingly of the myopathic type. He had obvious difficulty in starting to walk after being in the sitting position, but when he began to walk his gait was not remarkable. When he stood on his toes for a short time he had some difficulty in bringing his heels down to the floor.

No abnormalities were noted on fundoscopic examination, and there were no obvious lenticular opacities. Slit-lamp examination, however, revealed punctate lenticular opacities in the peripheral portions of the cortex of each lens. The media were grossly clear. The pupils were round, regular, and equal, and they responded to light and accommodation. Extraocular movements were normal and there was no nystagmus.

There was no evidence of facial weakness, but in contrast to the man's rather mesomorphic appearance there were slight bilateral weakness and some atrophy of the sternomastoid muscles. The patient had generalized muscular weakness, most pronounced distally, in all extremities. No atrophy or fasciculations were present. There was striking enlargement of both calf muscles, which measured 38½ cm. in circumference in their largest diameter. Spontaneous myotonic reactions were observed in the hands and percussion myotonia was elicited in the tongue and thenar eminences.

Superficial and deep-tendon reflexes were active and equal bilaterally. There were no pathologic reflexes. Sensory examination and testing of cerebellar functions were entirely normal. The heart was not enlarged. There were no thrills or murmurs. The patient had a regular sinus rhythm with a pulse



of 80 and a blood pressure of 110/70. There was no testicular atrophy, and the body hair distribution was of the male type. The thyroid was not enlarged to palpation.

Hemogram, urinalysis, and erythrocyte sedimentation rates were within normal limits. Roentgenograms of the skull and the chest were normal. Results of other laboratory examinations are summarized in Table I.

The patient was started on procaine amide, 250 mgm. three times a day, and cortisone, 50 mgm. four times a day. On this regimen there was distinct subjective and objective improvement of his myotonia. The myotonic contractions in the hands almost completely disappeared, and the patient was able to rise from the sitting position more quickly and fatigued less rapidly when walking. Procaine amide

was discontinued after two weeks, and the patient continued to improve on cortisone alone.

After three weeks, cortisone was discontinued and the patient was given prednisone, 5 mgm. four times a day. He was discharged to his home on this medication, and when he was seen again, ten weeks later, the myotonic reaction was still abolished.

Discussion

Several features of the mode of onset in this case are unusual. First, there were several short episodes of transient "stiffness" which were minimal in duration and intensity; second, there occurred a sudden and severe episode of myotonia for which the patient first sought medical attention; last is the early complaint of enlarged calf muscles. The usual case of myotonia manifests itself by a slow, progressive, and persistent myotonia with atrophy or hypertrophy becoming noted somewhat later during the course of the disease.

In addition to the "classical" features of myotonia dystrophica such as cataracts, frontal baldness, muscular atrophy, sterility, and the myopathic facies, certain electrocardiographic abnormalities have been reported as well as low basal metabolic rates and a decreased excretion of urinary 17-ketosteroids, evidence to support the belief that this disease is multi-systemic in its involvement, and strongly suggestive of an endocrinopathy, the nature of which is still obscure.

In the present case, early cataracts, small sternomastoid muscles, the decreased urinary 17-ketosteroids, generalized muscular weakness, and the distribution of the myotonia suggest the diagnosis of myotonia dystrophica. Against such a diagnosis are the absence of frontal baldness, the absence of the characteristic facies, the lack of testicular atrophy, a normal electrocardiogram, no indication of endocrinopathy, and a negative family history. Adams, Denny-Brown, and Pearson⁷ stated that increased creatine and decreased creatinine excretion in the urine are the most constant biochemical changes in cases of myotonia dystrophica. The normal creatine-creatinine excretion ratio in this case seems fairly good evidence against any significant amount of muscle atrophy.

One of the outstanding signs in this case is the striking hypertrophy of the calf muscles, the characteristic feature of Thomsen's myotonia congenita. Myotonia congenita, however, usually manifests itself in early childhood, and frequently more than a single member of one family is affected. However, Adams, Denny-Brown, and Pearson⁷ stated that only one-fourth of the reported cases are hereditary, and in them the disorder appears as Mendelian dominant. Our patient was affected in early manhood, and there was no similar affliction of his siblings.

TABLE I
LABORATORY EXAMINATIONS

1. Blood

| | |
|-------------------------------|--------------------------------------|
| Fasting blood sugar: | 100 mg. per 100 ml. |
| Non-protein nitrogen | 34.4 mg. per 100 ml. |
| Serum albumin | 4.4 g. per 100 ml. |
| Serum globulin | 2.3 g. per 100 ml. |
| Serum creatinine | 1.2 mg. per 100 ml. |
| Total cholesterol | 270.0 mg. per 100 ml. |
| Cholesterol esters | 138.0 mg. per 100 ml. |
| Serum sodium | 137 mEq. per 100 ml. |
| Serum potassium | 5.0 mEq. per 100 ml. |
| Serum chloride | 96 mEq. per 100 ml. |
| Serum carbon dioxide | 24.2 mEq. per 100 ml. |
| Serum calcium | 4.4 mEq. per 100 ml. |
| Serum phosphorus | 1.8 mEq. per 100 ml. |
| Thymol turbidity | 2 units |
| Protein bound iodine | 10.0 microgr. " |
| Bromsulphonpthalein retention | 0% |
| Alkaline phosphatase | 2.9 Bodansky units |
| Serum electrophoresis: | slight increase in alpha-2 globulins |

2. Urine

| | |
|---------------------------|----------------------|
| Creatine excretion | 0 |
| Creatinine excretion | 1.7 gms. per 24 hrs. |
| 17-Ketosteroids excretion | 12.8 mg. per 24 hrs. |

3. Cerebrospinal fluid

| | |
|----------------------|--------------------|
| Cells | 0 |
| Total protein | 35 mg. per 100 ml. |
| Colloidal gold curve | 0011110000 |

4. Miscellaneous

| | |
|-------------------------------|-----------------|
| Radioactive iodine uptake | 26% |
| Sperm count: good motility— | 120-140 million |
| Electrocardiogram: | normal |
| Biopsy, gastrocnemius muscle: | normal muscle |

In some instances myotonia dystrophica may undoubtedly progress for a while without showing some of the characteristic features of the disease. However, in our patient the disease has been present for at least 12 years, and only minimal dystrophic or endocrinopathic manifestations could be demonstrated. On the other hand, early hypertrophy of the calves is strongly suggestive of the type of muscular involvement seen in myotonia congenita. Our case may deserve classification simply as an abortive case of myotonia dystrophica, but, in the presence of a well-developed myotonic reaction and obvious muscular hypertrophy, it would seem not illogical to consider it a transitional case between two closely related disease entities.

Cases similar to the present one have been reported before. For example, A. M. (family 121 of Maas and Paterson⁸) was a man of pyknic build, had generalized myotonia and hypertrophy of the deltoids, pectorales, and thigh muscles. Such features are characteristic of myotonia congenita, but the patient also had myopathic facies and pronounced wasting and weakness of other muscles, features which are characteristic of myotonia dystrophica.

Another case in this series was that of J. G. Goo (family 56), who had suffered from stiffness since infancy and possessed the typical "Herculean body build" frequently described in myotonia congenita. He subsequently developed wasting of the sternomastoids and facial muscles, at which time his illness was rediagnosed as myotonia dystrophica.

Arthur R. Bu (family 19) was believed to have myotonia congenita when he was 22, but four years later he showed wasting of certain facial muscles and the left sternomastoid, muscular weakness, frontal baldness, myopathic facies, and lenticular opacities, at which time there was no question as to the diagnosis of myotonia dystrophica.

It was well established that quinine had no effect on our patient's disease. His lack of response to procaine amide may be due to the fact that he was given a maximum of only 750 mg. per day, while the favorable results reported by Geschwind and Simpson⁹ in nine myotonic patients were obtained by administering daily amounts of between 2,000 and 5,000 mg.

The merits of steroid therapy in myotonia are still not completely evaluated. In 1950 Milhorat¹⁰ first gave ACTH to two patients and reported subjective improvement. In the same year Shy, Brendler, Rabino-

witch, and McEachern¹¹ were the first to report an abolition of the myotonic reaction with cortisone in two patients. In 1954 Garai¹² reported a good response to ACTH in two of four patients. In one of the patients this response lasted six to eight weeks after the last administration of ACTH. Holland and Hill⁶ obtained a transitory abolition of the myotonia by giving intravenous ACTH to one patient.

On the other hand, Trevathan and Hussar,³ in 1953, reported no improvement in one patient who was given at first as much as 200 mg. of cortisone daily, followed by 100 mg. daily of ACTH, nor in another patient who received 100 mg. of cortisone daily.

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Voluntary health insurance now pays more than 25 per cent of the total annual expenses for all personal health services incurred by both insured and uninsured persons in this country, Health Information Foundation reports.

Medical Services

Distribution of Physicians and General Hospital Beds in Kansas in 1955

E. V. THIEHOFF, M.D., *Kansas City*

Specialization of Kansas Physicians

A study of the distribution of physicians and their services in Kansas would not be complete unless attention is given to the relative distribution of the services of specialists and general practitioners. In dealing with this matter, physicians have been divided into three categories:

1. Certified specialists
2. Non-certified specialists
3. General practitioners

The designation of specialist is entirely the decision of the individual physician. So we find a wide range of criteria as to what constitutes a specialist. This is true in the non-certified group of specialists. With regard to certified specialists there are definite standards as to training and limitation of practice, established by specialty boards.

The list of physicians now in Kansas who are certified specialists was first determined by reference to the *Directory of Medical Specialists*, Volume 6, 1953 and then, more recently, to Volume 7, 1955, of that directory. The list of non-certified specialists was obtained from records of the Kansas Medical Society and from information supplied by physicians on their re-registration cards submitted to the Kansas State Board of Medical Registration and Examination. All other physicians, not listed as certified or non-certified specialists, have been classed as general practitioners, although undoubtedly there are many of these latter physicians who would consider themselves as non-certified specialists.

There is no general standard established as to the desirable proportion of specialists to general practitioners. This would necessarily vary from place to place, depending upon various factors. So we see there are definite limitations in the study of statistics related to specialization of physicians.

Table XV indicates that in Kansas we have gone a long way toward specialization; 40.5 per cent of the physicians in the state today regard themselves as specialists, 16.15 per cent by right of certification and 24.36 per cent by self designation. There are more in the latter group than in the former. And 59.5 per

The author is chairman of the Department of Public Health and Preventive Medicine, University of Kansas Medical Center.

| TABLE XV DISTRIBUTION OF PHYSICIANS BY SPECIALIZATION | | |
|---|---------------|-----------------|
| <i>Status as to Specialty</i> | <i>Number</i> | <i>Per Cent</i> |
| Certified | 378 | 16.15 |
| Non-Certified | 570 | 24.36 |
| General Practice | 1392 | 59.49 |
| TOTAL | 2340 | 100.00 |

cent of physicians in the state are classed as general practitioners. It is not known whether or not this is a desirable proportion.

It has been the consensus that the services of phy-

This is Part II of a three-part series. Part I appeared in the April issue of the Journal, and Part III will follow in June.

sicians, particularly specialists, are more readily available in the larger communities. Let us see what the situation is in Kansas.

| TABLE XVI | | | | |
|--|----------------------|-------------------|---------------------|-------|
| DISTRIBUTION OF PHYSICIANS BY SIZE OF COMMUNITY | | | | |
| Size of Community | Number of Physicians | | | TOTAL |
| | SPECIALTY | | | |
| | CERTIFIED | NON- CERTIFIED | GENERAL PRACTICE | |
| Large | 294 | 412 | 450 | 1156 |
| Intermediate .. | 75 | 129 | 523 | 727 |
| Small | 9 | 29 | 419 | 457 |
| TOTAL | 378 | 570 | 1392 | 2340 |

As was to be expected, there are many more physicians practicing in large communities (30,000 or more) than in small communities (less than 5,000). However, upon breaking these figures down as to

specialist and general practitioners, we see that specialists are predominantly in the large cities. General practitioners are about evenly divided between large and small communities, but there are more in cities of intermediate size (5,000 to 30,000 population). Let us see what these figures mean percentage-wise.

The large cities of Kansas (over 30,000 popula-

| TABLE XVII PERCENTAGE DISTRIBUTION OF PHYSICIANS BY SPECIALTY AND SIZE OF COMMUNITY | | | | |
|--|------------------------|-------------------|---------------------|--------|
| Size of Community | Status as to Specialty | | | TOTAL |
| | CERTIFIED | NON- CERTIFIED | GENERAL PRACTICE | |
| Large | 77.78 | 72.28 | 32.33 | 49.40 |
| Intermediate | 19.84 | 22.63 | 37.57 | 31.07 |
| Small | 2.38 | 5.09 | 30.10 | 19.53 |
| TOTAL ... | 100.00 | 100.00 | 100.00 | 100.00 |

tion) have 24.6 per cent of the state's population, but have 49.4 per cent of all physicians, 77.78 per cent of all certified specialists, 72.28 per cent of all non-certified specialists, and 32.33 per cent of the general practitioners. Of all physicians practicing in the large cities, 25 per cent are certified, 36 per cent are non-certified, and 39 per cent are in general practice, making a total of 61 per cent who consider themselves as specialists compared with 39 per cent who

| TABLE XVIII | | | | |
|---|-------------------------|----------------------|----------|--------|
| DISTRIBUTION OF PHYSICIANS BY PRINCIPAL CITIES | | | | |
| Place | Physicians SPECIALTY | | | TOTAL |
| | NON- CERTIFIED | GENERAL CERTIFIED | PRACTICE | |
| | NUMBERS | | | |
| Kansas City.. | 82 | 147 | 128 | 357 |
| Topeka | 86 | 121 | 105 | 312 |
| Wichita | 102 | 137 | 152 | 391 |
| Rest of State. | 108 | 165 | 1007 | 1280 |
| TOTAL | 378 | 570 | 1392 | 2340 |
| PER CENT | | | | |
| Kansas City.. | 21.68 | 25.79 | 9.2 | 15.26 |
| Topeka | 22.74 | 21.23 | 7.54 | 13.33 |
| Wichita | 26.97 | 24.03 | 10.92 | 16.71 |
| Rest of State. | 28.61 | 28.95 | 72.34 | 54.70 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 |

are general practitioners. So there appears to be a disproportionate number of specialists.

The cities of intermediate size (5,000 to 30,000 population) have 19.5 per cent of the state's population, 31.07 per cent of the state's physicians, and 19.84 per cent of the state's specialists. Of all physicians in cities of intermediate size, 28 per cent are classed as specialists and 72 per cent are in general practice.

In small communities (less than 5,000 population), 21.7 per cent of the state's population reside. Of the

| TABLE XIX DISTRIBUTION OF PHYSICIANS BY AGE AND SPECIALIZATION | | | | |
|--|-----------|-------------------|---------------------|-------|
| Age Group Years | Specialty | | | TOTAL |
| | CERTIFIED | NON- CERTIFIED | GENERAL PRACTICE | |
| Under 30 | 1 | 108 | 130 | 239 |
| 30-39 | 115 | 213 | 435 | 763 |
| 40-49 | 145 | 83 | 250 | 478 |
| 50-59 | 65 | 59 | 174 | 298 |
| 60-69 | 29 | 53 | 138 | 220 |
| 70-79 | 21 | 42 | 185 | 248 |
| 80 and over .. | 2 | 12 | 80 | 94 |
| TOTAL | 378 | 570 | 1392 | 2340 |

physicians practicing in these communities, only 8 per cent are specialists, leaving 92 per cent as general practitioners. It is rather surprising to know that there are 9 certified specialists practicing in these smaller communities.

Of course it is understood that medical services do overlap political boundary lines. This is especially true in the Kansas City area, as has previously been noted.

Kansas has three principal cities, two of which are

| TABLE XX AVERAGE AGE OF PHYSICIANS BY SPECIALTY | |
|---|---------------------------------|
| Status as to Limitation of Practice | Average/or Mean Age in Years |
| Specialty | |
| Certified | 46.5 |
| Non-Certified | 42.8 |
| General Practice | 48.9 |
| Average Age of all Physicians .. | 47.0* |

*Not an arithmetical average of above figures, but an average of the ages of all physicians in the state.

TABLE XXI
DISTRIBUTION OF PHYSICIANS BY SCHOOL OF GRADUATION AND BY SPECIALTY

| <i>Status as to Limitation of Practice</i> | K. U. | | <i>Physicians</i> OTHER KANS. SCHOOLS | | OUT OF STATE | | TOTAL | |
|--|-------|--------|---|--------|-----------------|--------|-------|--------|
| | NO. | % | NO. | % | NO. | % | NO. | % |
| <i>Specialty</i> | | | | | | | | |
| Certified | 135 | 14.11 | 4 | 7.14 | 239 | 18.01 | 378 | 16.15 |
| Non-Certified | 180 | 18.81 | 9 | 16.07 | 381 | 28.7 | 570 | 24.36 |
| General Practice | 642 | 67.08 | 43 | 76.79 | 707 | 53.29 | 1392 | 59.49 |
| TOTAL | 957 | 100.00 | 56 | 100.00 | 1327 | 100.00 | 2340 | 100.00 |

TABLE XXII
DISTRIBUTION OF PHYSICIANS BY SCHOOL OF GRADUATION AS
PERCENTAGE OF EACH SPECIALIZATION GROUP

| <i>School</i> | <i>Specialty</i> CERTIFIED | | NON-CERTIFIED | | <i>General Practice</i> | | <i>Total</i> | |
|----------------------------|-------------------------------|-------|---------------|-------|-------------------------|--------|--------------|--------|
| | NO. | % | NO. | % | No. | % | No. | % |
| University of Kansas | 135 | 35.7 | 180 | 31.6 | 642 | 46.12 | 957 | 40.90 |
| Other Kansas Schools | 4 | 1.0 | 9 | 1.6 | 43 | 3.09 | 56 | 2.39 |
| Out of State Schools | 239 | 63.3 | 381 | 66.8 | 707 | 50.79 | 1327 | 56.71 |
| TOTAL | 378 | 100.0 | 570 | 100.0 | 1392 | 100.00 | 2340 | 100.00 |

TABLE XXIII
DISTRIBUTION OF PHYSICIANS BY MAJOR GROUPS OF SPECIALTIES

| <i>Physicians</i> | SURGICAL | | <i>Specialties</i> MEDICAL | | OTHER | | <i>Total</i> | |
|---------------------------------|----------|--------|-------------------------------|--------|-------|--------|--------------|--------|
| | NO. | % | NO. | % | NO. | % | No. | % |
| Certified Specialists | 173 | 40.71 | 139 | 35.73 | 66 | 49.25 | 378 | 39.87 |
| Non-Certified Specialists | 252 | 59.29 | 250 | 64.27 | 68 | 50.75 | 570 | 60.13 |
| TOTAL | 425 | 100.00 | 389 | 100.00 | 134 | 100.00 | 948 | 100.00 |
| General Practice | 1392 | | | | | | | |
| Grand Total | 2340 | | | | | | | |

considered as medical centers because they have hospitals of 200 beds or more for general use and because they furnish internships and residencies in two or more specialties. The rest of the state is pooled into a fourth group or category.

Looking at Table XVIII we see that Wichita has the largest number of specialized physicians both quantitatively and percentage wise, as compared with the other two cities. Kansas City has the fewest number of certified specialists. This is more apparent when one realizes that of the certified specialists in

that city, most are located in the University of Kansas Medical Center. So Kansas City, Kansas, is a city of few certified specialists in private practice. People in that city often go across the state line to Kansas City, Missouri, when they are in need of the services of certified specialists because that is where more specialists are to be found.

It is commonly believed that specialization is particularly attractive to young men just finishing their medical education. Table XIX explores this possibility in Kansas. We have previously set up ages 30 to 59

years as the most effective age range in the practice of medicine. This age range includes 86.4 per cent of all certified specialists in Kansas, 62.2 per cent of all non-certified specialists, and 58.1 per cent of all general practitioners. From another point of view it is interesting to note that those physicians who are specialists (both certified and non-certified) make up 44.1 per cent of the 30-59 year age group.

Table XX gives the average age in the three categories as to specialization. Those practicing specialties are a little younger than those in general practice.

The University of Kansas School of Medicine emphasizes the training of general practitioners. Table XXI indicates the tendency of its graduates to specialize. Of the University of Kansas graduates now in the state, 67.08 per cent are in general practice, as compared with 14.11 per cent who are certified specialists and 18.81 per cent who are non-certified specialists.

A higher percentage (76.79) of graduates of other Kansas schools are in general practice, but this is to be expected as they received their training before specialization became emphasized as it is today.

Out of state graduates show 53.29 per cent as being in general practice as compared with 46.71 per cent who are specialists (both certified and non-certified). University of Kansas graduates have tended less toward specialization than have out of state graduates.

The data presented in Table XXI have been rearranged in Table XXII. This shows the proportionate distribution of each group of physicians (by school of graduation) to the ranks of specialists. All three groups make their largest contribution in the non-certified group of specialists as compared with those who are certified.

Let us now group the specialists in Kansas into three main categories: surgical, medical, and other, as shown in Table XXIII.

Of the 2,340 physicians in Kansas, 948 are considered as specialists; 60 per cent are non-certified. Of the specialists, 425, or 44.8 per cent, are in the field of surgery and its subdivisions; 389, or 41 per cent, are in medical specialties; and 134, or 14.2 per cent, are in all of the other specialties. Let us break the data down further to show the distribution of physicians by the field of specialty.

Table XXIV indicates the number of specialists in Kansas (certified and non-certified) in each field of specialty.

Summary

For the state as a whole, and out of the 2,340 resident physicians, 948, or 40.5 per cent, regard themselves as specialists. Six hundred and seventy-

TABLE XXIV
DISTRIBUTION OF PHYSICIANS BY
FIELD OF SPECIALTY

| Specialty | Specialty | | Total |
|--|-----------|---------------|-------|
| | CERTIFIED | NON-CERTIFIED | |
| I. Surgical | 173 | 252 | 425 |
| 1. Surgery | 55 | 126 | 181 |
| 2. Proctology | 1 | 1 | 2 |
| 3. Neurosurgery | 4 | 4 | 8 |
| 4. Orthopedic Surgery .. | 17 | 14 | 31 |
| 5. Plastic Surgery | 1 | 4 | 5 |
| 6. Obstetrics | 1 | 5 | 6 |
| 7. Gynecology | 0 | 1 | 1 |
| 8. Obstetrics and Gynecology | 22 | 32 | 54 |
| 9. Ophthalmology | 26 | 13 | 39 |
| 10. Otorhinolaryngology .. | 27 | 31 | 58 |
| 11. Ophthalmology plus Otorhinolaryngology .. | 6 | 5 | 11 |
| 12. Urology | 13 | 16 | 29 |
| II. Medical | 139 | 250 | 389 |
| 13. Dermatology | 8 | 6 | 14 |
| 14. Internal Medicine ... | 64 | 94 | 158 |
| 15. Allergy | 0 | 3 | 3 |
| 16. Cardiovascular Diseases | 0 | 1 | 1 |
| 17. Gastroenterology | 0 | 0 | 0 |
| 18. Tuberculosis | 0 | 2 | 2 |
| 19. Pediatrics | 29 | 27 | 56 |
| 20. Psychiatry | 6 | 102 | 108 |
| 21. Neurology | 0 | 0 | 0 |
| 22. Psychiatry plus Neurology | 32 | 15 | 47 |
| III. Others | 66 | 68 | 134 |
| 23. Anesthesiology | 11 | 24 | 35 |
| 24. Pathology | 16 | 15 | 31 |
| 25. Clinical Pathology ... | 0 | 0 | 0 |
| 26. Bacteriology | 0 | 0 | 0 |
| 27. Radiology | 30 | 16 | 46 |
| 28. Industrial Practice ... | 0 | 1 | 1 |
| 29. Others | 9 | 12 | 21 |
| TOTAL | 378 | 570 | 948 |
| General Practice | | | 1392 |
| GRAND TOTAL | | | 2340 |

five of the specialists, or 71.2 per cent, are located in the three principal cities of the state. However, these cities only have 21.2 per cent of the state's population. In these same cities, 675, or 63.6 per cent of

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Cryptococcosis

Treatment of Two Cases with Stilbamidines

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To 1951 the number of reported cases of systemic cryptococcosis approached 220.² Thirty-three of these patients were still alive to the publication dates. Ten more cases have been added as interest in the disease increases.³ A nearly hopeless prognosis heightens the need for an effective therapeutic attack.

The aromatic diamidines, particularly stilbamidine, Propamidine, and diethylstilbesterol, show antimycotic effects.¹ In blastomycosis, both cutaneous and systemic, the use of stilbamidine has been gratifying.⁴ A morphological likeness between this fungus and cryptococcus leads one to hope that stilbamidine might also be useful in treating cryptococcus infections. Miller et al. in 1952 reported using stilbamidine unsuccessfully in three patients with cryptococcosis.¹² In 1953 these authors reported like results in experimental infections in mice.¹³ Sensitivity tests are not recorded.

Our two cases were similarly treated, the first mainly with stilbamidine, the second with a presumably less toxic derivative, 2 hydroxystilbamidine. In vitro sensitivity tests of these drugs on the organisms were obtained in each case.

Case 1

History (Obtained from wife): W. M., a 61-year-old white male, was admitted to Wesley Hospital on April 19, 1953. He had been acutely ill for five days with persistent frontal headache, fever of 100 to 103 degrees Fahrenheit, apathy, and drowsiness. On April 18 a tonic seizure occurred and the patient was unconscious for a short time. Following this seizure his speech was slurred, and he gradually became stuporous.

The past history was unimportant except for emotional instability and excessive fatigue for several years. He had been examined in a Veterans Administration hospital in 1948, but apparently no disease was found.

Physical examination: Temperature was 102 degrees Fahrenheit, pulse rate 80, respiratory rate 20, noisy but not labored.

The patient was emaciated, stuporous, and acutely and seriously ill. The pupil of the left eye was distorted by an old injury, but the right pupil reacted normally to light. The right fundus was normal, but

the left fundus could not be seen. Cervical rigidity was marked. Ankle jerks were absent bilaterally. There was no Babinski sign, but an Oppenheim sign was found on the left. The remainder of the physical examination was normal.

Hospital course and treatment: The patient remained stuporous and gradually developed spasticity in the left upper and lower limbs. His temperature was of a septic type, spiking to 104 degrees Fahrenheit daily. Cryptococcosis was suspected from the initial spinal fluid examination and was confirmed on repeated examination. The organism was also recovered from gastric washings. A culture was sent to Washington University in St. Louis, and the organ-

Two cases of systemic cryptococcosis are reported which were treated unsuccessfully with stilbene derivatives. Case 1 received stilbamidine and negligible amounts of 2-hydroxystilbamidine. Case 2 received ONLY 2-hydroxystilbamidine. The in vitro sensitivity of these organisms to 2-hydroxystilbamidine covers a wide range of concentrations, but in Case 2 antimycotic activity is demonstrated.

ism was identified there also as *Cryptococcus neoformans*.

Initial treatment was supportive and included penicillin and streptomycin. Stilbamidine was started April 25 in daily doses of 450 mg. given intravenously in 1000 cc. of fluid. After four days the daily dose was reduced to 300 mgm. for three days, then to 150 mgm. for six days. On the 14th day 450 mgm. was given and on the 15th day 300 mgm. The total amount given was 4.35 Gm. A few doses of 2-hydroxystilbamidine were given during the last week of the patient's illness.

On the day after stilbamidine was begun the temperature leveled off at 100 to 102 degrees Fahrenheit. The spinal fluid cell count decreased, but organisms were still present. There was slight temporary improvement in the patient's mental status, and there

appeared to be some clearing of infiltrations found in chest x-rays. Later the patient became completely unresponsive and unable to move his lower extremities or to swallow. The temperature rose to 107 degrees Fahrenheit on May 9, 1953, and he died the next day. Autopsy was not permitted.

Significant laboratory findings: Initial white blood count 18,900; differential—segs 79 per cent, bands 5 per cent, lymphs 16 per cent.

Spinal fluid examination:

April 20, 1953—cells 241 per cu. mm., 60% polys, 40% lymphs

April 21, 1953—cells 396 per cu. mm., 60% polys, 40% lymphs

Pandy test 2+

Sugar 54 mgm. %

Total protein 184 mgm. %

Chloride 692 mgm. %

Colloidal gold 012233100

April 22, 1953—cells 393 per cu. mm., 78% polys, 22% lymphs

April 23, 1953—cells 310 per cu. mm., 69% polys, 31% lymphs

April 25, 1953—cells 340 per cu. mm., 70% polys, 30% lymphs

April 28, 1953—cells 62 per cu. mm., 23% polys, 77% lymphs (3 days after starting stilbamidine)

Case 2

History: The patient was a 59-year-old white male admitted to Wesley Hospital on May 9, 1955, with a chief complaint of headache. He had been seriously disabled for 25 years with chronic tophaceous gouty arthritis; polycythemia vera had existed since 1946; and he also had chronic pyelonephritis with hydrourter and hydronephrosis. He had been taking cortisone 25 mgm. three times daily for two years and probenecid 0.5 Gm. twice daily for six months.

One week prior to admission the patient developed a severe frontal headache with occipital radiation. This was constant and steadily increased in intensity. The day of admission fever, slight confusion, and blurring of vision were noted.

Physical examination: Temperature was 100.4 degree Fahrenheit, pulse rate 120, respiratory rate 24, blood pressure 145/90.

The patient was confused and complained bitterly of headache. There were tophi on ears, elbows, knees, and fingers with accompanying joint deformity. Tendon reflexes were hyperactive but equal. There was no nuchal rigidity, and the remainder of the physical examination was normal.

Hospital course and treatment: On admission a diagnosis of encephalitis was considered. Spinal puncture showed an initial pressure of 300 mm. of water with a clear spinal fluid. The spinal puncture gave

the patient much relief. The usual dosage of cortisone was continued, and aspirin was given for pain.

During the next five days there was sufficient symptomatic improvement to allow the patient to be up in his room. On May 15, 1955, he again became lethargic and developed diplopia. He remained thus for two weeks—the body temperature never being more than 100 degree Fahrenheit.

The second spinal fluid on May 17, 1955, showed a yeast-like organism which we thought was a contaminant. Culture of the third fluid on June 1, 1955, again demonstrated this organism which proved to be *Cryptococcus neoformans*. This culture was sent to the U. S. Public Health Laboratory in Kansas City, where the diagnosis was confirmed.

On June 1, 1955, the patient had a transient episode of unconsciousness. After the spinal tap this quickly disappeared. The spinal fluid pressure was then 340 mm. of water. On June 2, 1955, we started 2-hydroxystilbamidine in a daily dosage of 250 mgm. given intravenously in 500 cc. of fluid. This was continued until the patient's death on June 16, 1955. He was also given sulfadiazine 2.0 Gm. initially, followed by 1.0 Gm. every four hours for two days, then 2.0 Gm. every four hours. Six drops of saturated solution of potassium iodide were given three times daily.

No particular change in his condition was noted until June 9, 1955, at which time lethargy was marked, and there was weakness of the left lateral rectus and right facial muscles. A Babinski sign first appeared on the right and by June 15 was bilateral. Difficulty in swallowing was followed by coma, and he died on June 16, 1955.

Significant laboratory findings: May 9, 1955, blood urea nitrogen 57 mgm. per cent, serum uric acid 14.8 mgm. per cent.

Spinal fluid examination:

May 9, 1955—cells 450 per cu. mm., 51% polys, 49% lymphs

Pandy test +

Sugar 57 mgm. %

Total protein 123 mgm. %

Chloride 687 mgm. %

Colloidal gold 012221000

May 17, 1955—cells 111 per cu. mm., 50% polys, 50% lymphs

June 1, 1955—cells 114 per cu. mm., 55% polys, 45% lymphs

June 14, 1955—cells 3,567 per cu. mm.

Chest x-ray revealed a small annular shadow at the left base. This had been noted on a film in February 1955 but had not significantly changed.

At autopsy there were tubercle-like nodules on the dura and pia arachnoid over the brain and spinal

cord. These lesions contained cryptococci as did an area of abscess in the lung.

Discussion

Since the first recognition of cryptococcosis nearly 50 years ago, the search for a reliable treatment has been in vain.¹⁶ Carton, in a very complete review, lists 34 chemicals and two physical methods which have been tried.² These include antiseptics, dyes, biologicals, heavy metals, vitamin D, thymol, and antibiotics. Some important experimental work was done by Kligman and Weidman in 1948.⁹ *In vitro* studies were made with a great variety of agents which included fatty acids, sulfonamides, naphthaquinones, thiocarbamate derivatives, antibiotics, and certain members of the stilbene family. Appreciable inhibitory effects were observed from certain quinones, thiocarbamates, and antibiotics. Of the latter group actidione seemed to be almost specific for *Cryptococcus neoformans*. However, when this antibiotic (or any of the other agents) was given to mice, before or after intraperitoneal inoculation with the fungus, it invariably failed to prevent or overcome the infection.

Reports disagree concerning the effects of penicillin. Dawson et al. include the *Cryptococcus* in a list of organisms susceptible to penicillin;⁵ Hamilton and Thompson report the case of a patient who died, but in whom they felt that penicillin partially reversed laboratory findings.⁷ Others have found penicillin to fail completely.

Sulfadiazine has perhaps been used more in this disease than any other drug excepting iodides, but aside from the one evident cure of Marshall and Teeds, there have been no apparent beneficial effects.^{8, 10}

Terramycin was used unsuccessfully in one case, while intrathecal tyrocidine produced a remission of at least nine months in another case.

Intravenous alcohol 5 per cent is said to have produced good results in one case; however, this was an atypical one, and we are aware of no follow-up.

Actidione (cycloheximide), an antibiotic produced by *Streptomyces griseus*, has been intensively investigated. Carton treated four cases with it; none has been cured, but two patients were alive and seemingly improved at the time of the report.² Wilson and Duryea treated a case with actidione and the symptoms were wholly arrested, and spinal fluid became sterile, and the patient was well 20 months later.¹⁷

Because of the antimycotic activity of stilbamidine and its clinical usefulness in blastomycosis, we chose to try it (and later the 2-hydroxy derivative) in the treatment of our two cases of systemic cryptococcosis. The *in vitro* sensitivity studies on the organism isolated in each of these cases is as follows:

| Case 1 | Agent | Case 2 |
|---|-----------------------|---|
| Inhibition of growth at 1000 mcg. per cc. | Stilbamidine | Not tested |
| No inhibition up to 10,000 mcg. per cc. | 2-hydroxystilbamidine | Inhibition of growth at 20 mcg. per cc. |
| Resistant | Penicillin | Resistant |
| Resistant | Streptomycin | Resistant |
| Resistant | Aureomycin | Resistant |
| Resistant | Chloromycetin | Resistant |
| Resistant | Terramycin | Resistant |
| Resistant | Gantrisin | Resistant |
| Resistant | Triple sulfas | Resistant |
| Resistant | Sulfamerazine | Resistant |
| Resistant | Polymixin B | Resistant |
| Resistant | Bacitracin | Resistant |
| Not tested | Erythromycin | Resistant |
| Not tested | Furadantin | Resistant |
| Not tested | Neomycin | Resistant |
| Not tested | Achromycin | Resistant |
| Somewhat sensitive | Sulfadiazine | Resistant |
| Somewhat sensitive | Sulfathiazole | Resistant |

From the sensitivity tests we conclude that a clinical response to stilbamidine or 2-hydroxystilbamidine in Case 1 would be highly unlikely, yet a slight transient improvement *did* occur; whereas our studies in Case 2 allowed hope for benefit, since a concentration of 20 mcg./cc. is attainable in body fluids; nonetheless this patient showed no clinical response. (Of some interest here is the fact that Case 2 got large doses of sulfadiazine in addition to 2-hydroxystilbamidine.)

The fairly good degree of sensitivity shown by the organism of Case 2 in the *in vitro* tests suggests that 2-hydroxystilbamidine has antimycotic action and merits further study. Its use in another deep mycosis, coccidioidomycosis, has recently been reported by Snapper et al.¹⁴

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Abdominal Pregnancy

Report of Successful Management of One Case

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The following report of a rare surgical entity is presented in the hope that it will be of interest and may be of benefit to physicians who have not encountered the problem of managing a case of abdominal pregnancy.

The patient, a 42-year-old nulliparous white female, was first seen by us on June 15, 1953. Her chief complaint was intermittent and cramping pain in the left lower quadrant of the abdomen. She had first had the pain two weeks previously. She reported her most recent menstrual periods as having begun on April 5, 1953, and on May 1, 1953.

A physician she saw on June 1, 1953, related her symptoms to the beginning of the menopause and prescribed oral estrogen as symptomatic relief. After taking four or five doses of the medication, she became nauseated and developed severe anorexia, pain, and cramping in the left lower quadrant, progressively severe.

The patient reported to us that she "had never been able to get pregnant," in spite of the fact that no contraceptive devices had been used. She gave no history of gynecological infection and felt that she had always been in good health. Two years previously she had undergone surgery for removal of a mole on the left lower leg. She reported that the mole was diagnosed as malignant. The family history was non-contributory.

Physical Examination

The patient was well developed, well nourished, and appeared to be the stated age. Her temperature was 99.6 degrees, and blood pressure was 110/70. Mucous membranes and skin appeared pale and sallow. Her attitude was that of a depressed person, but she did not appear to be acutely ill.

Palpation of the abdomen revealed a mass in the left lower quadrant approximately 6 by 6 cm. It was fixed and soft, and the entire quadrant was tender to palpation.

On pelvic examination the vaginal vault was found to be filled with a profuse, foul smelling, dirty gray discharge. The cervical os was small and round with some erosion and was apparently the source of the discharge. The cervix itself was innocent in appearance. The uterus was about twice normal size and seemed softer to palpation than normal. The right

adnexa was free but tender, and the left adnexa was examined with difficulty because of extreme tenderness. It was the examiner's impression that the mass was adjacent to the left tubo-ovarian region.

On vaginal-rectal-abdominal examination the uterus, although enlarged, could be distinguished from the mass in the left lower quadrant.

Laboratory examination revealed hemoglobin 59 per cent; red blood count 3,440,000; white blood count 8,000; Wassermann negative, and urinalysis negative.

Experience with one patient leads to the conclusion that a physician should suspect pregnancy in any female of childbearing age with abnormal bleeding, anticipate hemorrhage in the disruption of an abdominal pregnancy, and avoid removal of the placenta from its attachment if hemostasis is secure.

Pregnancy was considered, but a conservative regimen was chosen for two reasons: (1) The patient had never before conceived; (2) The symptoms of fever and profuse vaginal discharge pointed strongly to an inflammatory or malignant mass in the left tubo-ovarian region. In addition, she was anemic and in need of physical rehabilitation before surgery.

She was given antibiotics, B₁₂, and iron. After surprising improvement on those medications, she was admitted to the hospital for surgery on July 7, 1953. Examination at that time showed that the mass had almost doubled in size, making surgery imperative.

Urinalysis on the morning of surgery revealed a two plus qualitative Benedict's test, but a fasting blood sugar revealed 110 mgm. per cent of glucose.

Surgery

The abdominal cavity was entered through a 10 cm. lower midline incision. A fixed, soft membranous mass containing fluid was found in the left lower quadrant. It was attached to the lateral wall of the abdominal cavity and adherent to the mesentery and small bowel posteriorly, the cul-de-sac and sigmoid inferiorly, and to the broad ligament and the posterior

portion of the uterine fundus anteriorly. The mass measured approximately 10 by 10 cm.

On palpation of the mass, the uterus was antiflexed. This ruptured the cystic mass and brought forth an almost exsanguinating hemorrhage, difficult to control because of a bloody field and friable tissues. To combat shock, 1,000 cc. of whole blood was started.

A fetus measuring 14 cm. was taken from inside the amniotic sac, the cord was ligated and severed, and loose fragments of placental tissue were removed. Ligatures were useless in this friable mass of placental tissue. A large curved hemostat, which apparently contained the base of the implantation on the lateral wall of the abdomen, was left in place. Gelfoam packs were placed in the cul-de-sac, and a large pack was loosely placed posterior to the uterus, allowing about one-half of the pack to protrude, along with the hemostat, through the distal part of the abdominal incision. When hemostasis was secure, the abdominal incision was closed in the usual manner.

Postoperative Course

The patient was returned to her room in fair condition. Blood volume was replaced, and she was given antibiotics and fluids. These, with general supportive measures, contributed to an uneventful postoperative course. The pack was removed on the third postoperative day, and the hemostat was removed on the fourth postoperative day.

A fecal fistula developed on the 11th postoperative day. Neomycin therapy was instituted, and four days later the fistula closed spontaneously.

The patient was discharged on her 20th hospital day. She was ambulatory, and her abdominal incision was well healed except for the lower part which required dressings for the following three weeks. She enjoyed complete recovery.

Conclusion

Our experience with this patient leads us to conclude that a physician should (1) suspect pregnancy in any female of child bearing age with abnormal uterine bleeding; (2) anticipate hemorrhage in the disruption of an abdominal pregnancy; (3) avoid removal of the placenta from its attachment if hemostasis is secure.

Abdominal pregnancy is a rare entity occurring once in about 12,500 pregnancies, 3 to 1 times more often in Negroes than in white women. The patho-

genesis is apparently that of tubal pregnancy precipitated by an underlying chronic salpingitis. As in this case, the highest incidence is in primigravidae who may or may not give a history of pelvic inflammatory disease.

Perhaps the tubal pregnancy is aborted, or partially aborted, to attach itself to any organ or viscus in the abdomen. It is apparent that some of the chorionic villi must retain their integrity while the secondary site is being invaded. The tubal rupture is thought to occur between the third and fourth month of gestation.

Lower abdominal pain is an outstanding symptom. Other symptoms are nausea, vomiting, syncope, and shock, depending on the amount of bleeding that occurs at the time of rupture. Symptoms, except for lack of menstruation, may be absent for a time. At about five months gestation, the patient develops painful fetal movements, and it is during this time that fetal bones can be outlined by x-ray for study of the position of the fetus. It is interesting to note that the uterus will be enlarged to about three times its normal size and show decidual reaction.

After a positive diagnosis has been reached, there is no reason for delaying surgery. Spontaneous rupture of the sac may result in an exsanguinating maternal hemorrhage.

There is apparently no one method of managing the placenta that is adaptable to every situation the surgeon may encounter. However, since there is no apparent danger in leaving the placenta intact, that may be done.

It is important to conserve maternal blood and to have at least 1,000 cc. of compatible blood available for transfusion.

Closing the abdomen with or without drainage is controversial and must be left to the surgeon at the time of operation.

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In the past eight years, the proportion of the nation's total medical expenses met by voluntary health insurance has increased three times as fast as the proportion of Americans holding such insurance, according to Health Information Foundation.

PRESIDENT'S PAGE

DEAR DOCTOR:

Truly, it would be presumptuous to assume that momentous achievements shall be accomplished in the short period of one year.

A gifted surgeon-teacher once said, "Your sutures are merely a hint to nature, suggesting where to start the healing process." So, it in no manner disregards the high honor, nor belittles the responsibilities nor the importance of his office, when one confesses he can only hope to "hint" at important activities for his organization.

For this 99th year of the Kansas Medical Society there are many tasks to challenge our mettle.

- Item*: That product of years of "blood, sweat and tears," the amazing final accomplishment of a sound medical practice act and basic science law. Unbelievably, they are fact and in force. They are yet to be implemented, put into gear, and set into operation.
- Item*: The great responsibility of the medical profession to take positive action to help curtail the slaughter on the highways that takes a human life every 14 minutes, produces a serious injury every 24 seconds, 24 hours a day.
- Item*: The continuing responsibility to expand and develop Blue Shield, to further aid our patients to meet the difficult economic problems of illness; to further enlighten and familiarize our membership with the philosophy, aims, and tremendous value of Blue Shield to the American public and, therefore, also and incidentally, to ourselves.
- Item*: The tremendous need for psychiatric services which can be available to our patients and which can be obtainable within their financial capacities. Coupled with this, the great need for psychiatric orientation and understanding on the part of the profession as a whole, as well as closer liaison with, and a better understanding of, the problems of the rest of the profession, on the part of the doctor who specializes in psychiatry.
- Item*: The problem of emphasizing to the profession in Kansas the vital importance of the American Medical Education Foundation and the urgent need for our active support.
- Item*: The day by day operation of one of the most vigorous, active, individualistic, and aggressive of all the state medical societies.

Not to mention the long list of many and various tasks that are pressing for the attention of the conscientious energetic committees which are the real, functioning, productive machinery of our organization.

Humbly yours,

A stylized, cursive handwritten signature in dark ink, reading "Darrin A. Nelson". The signature is fluid and elegant, with long, sweeping strokes.

President

EDITORIAL COMMENT

Uniform Narcotics Act

On July 1, 1957, Kansas will have in effect a new act controlling narcotic drugs. This is in compliance with the recommended federal act and is known as the Uniform Narcotic Drug Act. It is a rather long bill, carefully regulating a great many possible situations of which this summary will consider only those of interest to medicine. The bill also regulates use of narcotics by the dentist, the veterinarian, the manufacturer, the wholesaler, the pharmacist, etc.

"Physician" shall mean any person authorized by law to treat sick and injured human beings in this state and to use narcotic drugs in connection with such treatment." The law makes no change in who is licensed to use narcotics. Everyone currently licensed to prescribe narcotics may do so in the future. No new privileges are granted.

"Narcotic drugs" means coca leaves, opium, cannabis, isonipecaine, amidone, isoamidone, ketobemidone and every other substance neither chemically nor physically distinguishable from them; any other drugs to which the federal narcotic laws may now apply; and any drug found by the state board of pharmacy and the state board of health, after reasonable notice and opportunity for hearing, to have an addiction-forming or addiction-sustaining liability similar to morphine or cocaine, from the effective date of determination of such finding by said state board of pharmacy and state board of health."

It will be noted that anything that the federal narcotic laws list as narcotics or whatever the state board of pharmacy and the state board of health list as narcotic drugs will come under this act.

The act states that a pharmacist in good faith may sell and dispense narcotic drugs to any person upon a written prescription of a physician, dentist, or veterinarian, dated and signed on the day issued and bearing the full name and address of the patient for whom the drug is dispensed, and the full name, address, and registry number under the federal narcotic laws of the person prescribing. The person filling the prescription shall write the date of filling and his own signature on the face of the prescription. The prescription shall be retained on file by the proprietor of the pharmacy in which it is filled for a period of two years, so as to be readily accessible for inspection by any public officer or employee engaged in the enforcement of this act. The prescription shall not be refilled.

The act then says that such narcotic drugs possessing little or no addiction liability and which are so

listed by the federal laws may be dispensed upon an oral prescription.

Even then a pharmacist "... may sell to a physician, dentist, or veterinarian, in quantities not exceeding one ounce at any one time, aqueous or oleaginous solutions of which the content of narcotic drugs does not exceed a proportion greater than 20 per cent of the complete solution, to be used for medical purposes. A physician or a dentist, in good faith and in the course of his professional practice only, may prescribe, administer, and dispense narcotic drugs, or he may cause the same to be administered by a nurse or interne under his direction and supervision."

Exempted is the selling, or dispensing at retail, of any medicinal preparations that contain in one fluid ounce, or if a solid or semi-solid preparation, in one avoirdupois ounce, not more than one grain of codeine or of any of its salts, or not more than one-sixth grain of dihydrocodeinone or any of its salts, provided that the preparation shall contain, in addition to the narcotic drugs, some other drug conferring upon it medicinal qualities and provided that it is used in good faith as a medicine. Every physician must keep a record of narcotic drugs received by him and a record of all such drugs administered, dispensed, or professionally used by him other than by prescription.

An exception is that "... no record need be kept of narcotic drugs administered, dispensed, or professionally used in the treatment of any one patient, when the amount administered, dispensed, or professionally used for that purpose does not exceed in any 48 consecutive hours (a) four grains of opium, or (b) one-half of a grain of morphine or of any of its salts, or (c) two grains of codeine or of any of its salts, or (d) one-fourth of a grain of heroin or of any of its salts, or (e) a quantity of any other narcotic drug or any combination of narcotic drugs that does not exceed in pharmacologic potency any one of the drugs named above in the quantity stated."

The patient may lawfully possess narcotic drugs only in the containers in which they are delivered to him by the person selling or dispensing the same.

All narcotic drugs which are not lawfully owned shall be forfeited and disposed of by the secretary of the state board of health.

On the conviction of any person in violation of this act, the licensing board under which he practices shall be ordered to revoke his license, which may be reinstated only upon proper showing and for good cause.

The law states that information communicated to a physician in an effort unlawfully to procure a narcotic drug, or unlawfully to procure the administration of any such drug, shall not be deemed a privi-

leged communication. It then sets a number of penalties for violations and states that cities of the first, second, and third classes may adopt ordinances, not in conflict with this act, for the purpose of controlling traffic in narcotic drugs within their corporate limits.

Also becoming a law on July 1, 1957, is a new act controlling "... (a) the salts and derivatives of barbituric acid or compounds or preparations or mixtures thereof; (b) amphetamine, its salts and derivatives or compounds, preparations or mixtures thereof; and (c) other drugs or compounds, preparations or mixtures thereof which the state board of health shall find and declare by rule or regulation duly promulgated after reasonable public notice and opportunity for hearing to have a dangerous hypnotic, somnifacient or stimulating effect on the body of a human or animal; except that the term 'drug' shall not include any drug the manufacture or delivery of which is regulated by the narcotic drug laws of this state." As used in this act a "dangerous drug" means one that is unsafe for use except under the supervision of a practitioner because of its toxicity or other potentiality for harmful effect, method of use, or collateral measures necessary to use. The words "somnifacient" and "stimulating" as used in this act shall have the meaning attributable in standard medical lexicons.

This act authorizes the board of health to promulgate necessary regulations for the administration and enforcement of this act. It provides for penalties for violations, requires records of purchases to be kept for two years, and declares that a telephone prescription "shall be promptly reduced to writing . . ." and that it may not be refilled "unless such refilling is specifically authorized by the prescriber."

The term "practitioner" is defined as "any person authorized by law to prescribe and administer drugs, as herein defined, in the course of his professional practice; professional practice of a practitioner means treatment of patients under a bona fide practitioner-patient relationship." Therefore, as in the previously described act, no new practice privileges are conferred.

Soviet Medicine

In a recent issue of *Problems of Communism*, a magazine published by the U. S. Information Agency, there is an article entitled "The Soviet Doctor's Dilemma" by Mark G. Field, an American sociologist who is with the Russian Research Center at Harvard. The article states that the Ministry of Health has established that a physician must see not less than six patients an hour and spend not more than ten minutes with each patient. Surgeons examine ten patients per hour, obstetricians six, otolaryngologists

eight, and dentists two. One house call is considered the equivalent of three office visits.

Even this amount of time is not entirely spent with the patient. Of the ten minutes allowed for each patient, a period of eight minutes is required for the necessary paper work, and something under two minutes is devoted to listening to a description of symptoms and the examination.

Mr. Field visited the U.S.S.R. last summer in company with Paul Dudley White, M.D., of Boston. In this report Mr. Field says the ordinary patient puts up with a great deal of bureaucratic inefficiency and indifference and with all kinds of deficiencies and shortages. The emphasis is all on keeping the working man at his job, so physicians are forced to be more like policemen than like doctors, and they work in overcrowded facilities and often lack the most common medicines. However, even at this, medical services have improved in the last few years. By the end of 1955 there were 1,290,000 hospital beds and 334,000 doctors in Russia.

Mr. Field says, "The Soviet hero is not the healer but the man who builds machinery for industry or the one who 'fights' for the cause. By the same token, the financial rewards which doctors can command generally compare unfavorably with those of government officials or skilled industrial workers. At the Kharkov Electro-Mechanical Plant I was told that most qualified workers earned approximately 2,000 rubles a month. The average physician's salary was reported to be about 750 rubles to 800 rubles a month.

"A doctor is also at a relative disadvantage when it comes to obtaining housing and furnishings. Housing, for example, is assigned first to party and other officials, then to technical and other specialists. Only what is left over is available to physicians.

"It is interesting to note that in the Soviet Union medicine has become a woman's occupation. About seven to eight out of ten doctors are women."

Heedless Horsepower

In the year 1956, the Age of the Automobile came into its own. A multibillion dollar highway development program was passed by Congress, assuring the motoring public of wider, longer, straighter roads in the years to come. Automobile manufacturers fashioned dreams of steel; powerful, sleek, multicolored models with push-button operation from dashboard to tail-light. And, the nation's drivers made certain that accident statistics came of age, too.

They killed, maimed, crippled and destroyed more men, women, children and property than ever before. While we began to blueprint America's vast

highway network of the future, heedless horsepower ran rampant on the roads of the present . . . warming up for the greater days that lie ahead.

From our statistical vantage point, we can see at a single glance every one of the accidents that occurred on our highways in 1956. We can see cars spinning out of control on wet or icy roads, pedestrians struck down as they cross against the light, weary, drunk, or inconsiderate drivers, gambling their reflexes against their lives . . . or the lives of others. We see the reckless young, dashing to a date with eternity; the careless old, spinning to disaster in an automobile that hasn't been checked in years. State by state, day by day, we can call off the grisly roll: 40,000 deaths, almost 6 per cent more than 1955; 2,368,000 injuries, up almost 10 per cent over 1955. One in every 70 Americans a statistic . . . a pain-wracked survivor, or a name in the obituary column.

But as we survey this appalling panorama, one pattern immediately stands out. It is a straight road on a clear day. Conditions perfect. A car that responds instantly to the driver's touch. One after another they zoom by; unthinking, unreflecting, letting heedless horsepower rush them to the unexpected accident that waits just down the road.

Heedless horsepower. It is a chronic disease of the Age of the Automobile. Its symptoms are many and various. The heavy foot on the accelerator; the eye fixed on the climbing speedometer; the hand on the horn; the mind idling while the car is in high. This is what we see in the vast majority of cases, as the grim spectacle of last year's accidents unfolds.

Over the past 30 years, many attempts have been made to embody safety in motor vehicle design and equipment. There can be no doubt that all steel bodies, safety glass, seat belts, padded instrument panels, power brakes have made automobiles less lethal to their occupants. However, all these safety devices are nullified by any combination of speed plus carelessness, thoughtlessness and lack of consideration.

The disease of heedless horsepower is highly contagious. It can be spread by an irresponsible word, an inflated claim, a careless example. And everyone who is in a position to influence drivers should learn that horsepower, in the hands of the heedless, is the fundamental cause of our ever-mounting toll of disaster.

However, it is the driver, not the manufacturer, the advertiser, or the salesman who must bear the greatest weight of blame. For it is the driver who can control the horsepower and use it safely for his greater ease and convenience. It is the driver who is lectured to, legislated at, prayed for, preached to . . . in every medium of public expression known

to man. And it is the driver who nods sagely, promises readily, and forgets everything but his sense of overwhelming power when he steps on the gas.

Now we stand looking down on the widespread montage of the American highway of 1957. Already, heedless horsepower has taken its toll. But every year we get another chance to learn by experience, to profit from the deadly mistakes of the past. Slow down. We want to write to you . . . not about you next year.—*The Travelers Insurance Companies, Hartford, Connecticut*

Radiological Society Elects

A meeting of the Kansas Radiological Society was held in Kansas City in February, and the following officers were elected for the year: president, Dr. G. Sherman Ripley, Jr., Salina; vice-president, Dr. Louis G. Allen, Kansas City; secretary, Dr. James R. Stark, Wichita; councilor to the American College of Radiology, Dr. Charles M. White, Wichita; alternate councilor, Dr. A. M. Cherner, Hays.

Research in Cancer Chemotherapy

Cooperative studies in human cancer chemotherapy were begun recently by investigators at the University of Kansas School of Medicine and personnel of eight other teaching institutions. Initial studies will be on chronic leukemias and selected types of malignant growths. The work in Kansas will be done under a grant of \$106,639 recently provided by the National Institutes of Health.

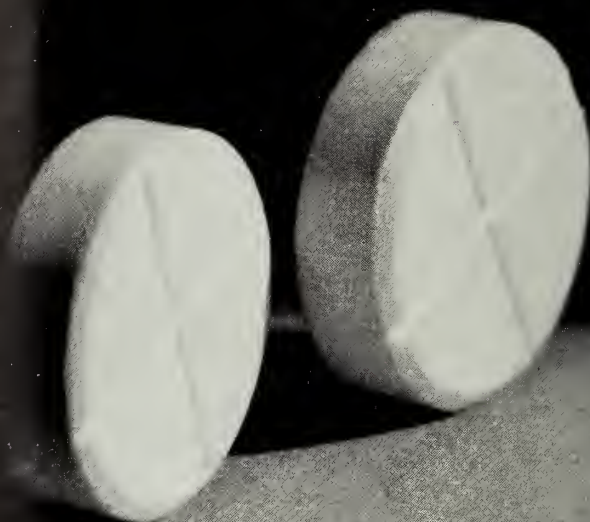
Workers on the campus in Kansas City will be Dr. Sloan Wilson, associate professor of medicine and oncology and head of the hematology section, and Dr. William E. Larsen and Dr. John Christianson, associates in the department of medicine.

Plans for the work were outlined at meetings held recently in New Orleans, Atlanta, and Miami. It is felt that the cooperative studies will develop more data in six months than could be developed in several years if each school were working independently. There are approximately 10,000 compounds to be tested in animal experiments before they can be tried on human subjects.

Working with the Kansas school on the project are the University of Mississippi, the Medical College of Alabama, the University of North Carolina, the Medical College of Virginia, the University of Miami, Washington University, Duke University, and Emory University.

Of drivers in 1956 highway accidents, 96.7 per cent had more than one year's driving experience.

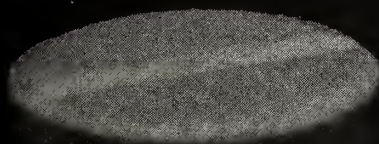
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"Nature produces diseases and their antidotes. The pharmacist prepares and compounds, but the physician alone interprets symptoms, seeks out their causes and devises the cure. Unless sure of his remedy, it is as criminal to give it to a beggar as to a prince. . . .

"That wisdom is better than rubies has gone unchallenged for 30 centuries, until today the proverb is doubly true, for the wisdom of the present includes more perfect knowledge of the causes and control of diseases than was attained in any age of all the past. As a correct use of the facts now known to science would prevent most cases of sickness, and annually save millions of lives, how important that the masses be taught until everywhere the incantations of the voodoo shall give way to germicides, the darkness of superstition to the light of biology flooding the world.

"To remain in the front rank of the world's benefactors, the physician, too, must add to the sum of useful knowledge in terms that can be understood. 'All that a man hath will he give for his life,' and he should no longer be barred from knowing himself, from acquiring the best possible knowledge of physiology and hygiene, and from learning to outwit and destroy the micro-organisms that would make of him their prey.

". . . The doctor has stood aloof from the people too long, to their anxious inquiries has replied in an unknown tongue, and mystified what should have been made plain, until it is not wholly his own fault that the average individual knows less of himself than of almost everything else. You may doubt this statement, or say that it is not true, but the trainloads of patent dopes, the worse than worthless nostrums marketed annually, and the golden harvests gathered all the year by advertising charlatans, prove that it is true; . . .

"Education is the only remedy. Encourage study. Disseminate knowledge. Let all be informed upon sanitation and the nature of the more common maladies, and there will come ability to discern between quackery and skill, between the false and the true. And the physician's usefulness will keep pace, always, with the advance. Indeed, it is only where there is this

intelligence that he can have the unswerving confidence of the patient and his friends, that co-operation in emergencies, so essential to the highest success in long and desperate combats with disease.

"A strictly scientific classification has not been attempted. As far as possible, plain, simple language has been used, and technical terms avoided. It is not expected that anyone, not possessed of special knowledge and experience, will attempt to treat the more serious forms of disease, but that the information here given will prove most valuable in preventing sickness, in accidents and other emergencies, and by enabling all to better cooperate with the physician in his best efforts to save life. If the work adequately meets, as we trust it will, the needs of those for whom it was written, we shall not consider that our long and laborious task has been in vain."

We are apt to think that the present-day dissemination of medical and scientific facts to the public through the medium of books, magazines and addresses is a new development; that we are exploring a new path in public relations for medicine. Such, however, is not quite the case. The foregoing quotations are from the introduction to a treatise* of over 800 pages, written for the general public by eleven physicians** and one dentist† who were members of the faculty of the old Kansas Medical College—the medical school of Washburn College, in Topeka. Under the editorship of W. E. McVey (who was also editor of the JOURNAL and secretary of the Kansas Medical Society at the time), the book was published by Herbert S. Reed, of Topeka, in 1900. It bears testimony to the fact that these faculty members were not unmindful of a responsibility in addition to that of treating patients and teaching medical students, and they devoted a considerable effort—the "long and laborious task"—toward fulfillment of that obligation. It makes interesting reading.—O.R.C.

* The Human Machine: Its Care and Repair.

** Ida C. Barnes, Louis C. Duncan, B. D. Eastman, Joseph T. Lovewell, Robert S. Magee, John C. McClintock, Richard E. McVey, William E. McVey, John E. Minney, Theodore W. Peers, W. L. Schenck.

† Alfred C. Sloan.

LETTERS TO THE EDITOR

The following communication, written by L. E. Krause, D.S.C., Great Bend, concerns a subject thought to be of interest to JOURNAL readers, the practice of chiropody today.

Too many people, unfortunately, are misinformed about chiropody and its scope of practice. Most physicians probably know less about chiropody than any other branch of medicine. Many have difficulty in pronouncing the name correctly, perhaps because the first two syllables of the word sound as if "practor" were going to follow. Gould's Medical Dictionary defines a chiropodist (podiatrist) as a specialist in diseases of the feet. Kansas statutes relating to the practice of chiropody define a chiropodist (podiatrist) as a physician of the foot.

The curriculum of a modern chiropodist is similar to that of a dentist or a doctor of medicine. Chiropody does not use or teach cultist methods. It is a definite unit of medically trained students with known obligations toward the parent body of medicine, as well as a cognizance of a specialty practice. Our present education consists of a one- or two-year pre-medical course, followed by four years in one of six schools of chiropody and foot surgery recognized by the National Association of Chiropodists. The curriculum consists of about 4,400 hours or more in classrooms, laboratories, and clinics and includes bacteriology, pathology, histology, bio-chemistry, neurology, dermatology, orthopedics, anatomy, physiology, materia medica, pharmacology, surgery, physical diagnosis, and clinical and didactic chiropody. In addition, several states require a year of internship in a foot clinic or hospital after graduation before an examination for license will be given. All schools grant a Doctor of Surgical Chiropody degree (D.S.C.) except one which grants the degree of Doctor of Podiatry (Pod.D.). The degrees are synonymous.

In Kansas, the chiropody examining board is composed of two members of the medical examining board and one chiropodist. The examination is given at the same time and place as the medical examination. Here we have the unique position of being the only allied medical profession completely and wholly under the jurisdiction of the parent body.

Some chiropody schools are associated with universities so that, in many instances, leading members of the faculty teach at both medical and chiropody schools. Each school has a large foot clinic attached to it where students receive practical clinical instruction and experience.

Many of the nation's leading hospitals and clinics have active chiropody services, and others are constantly being added. Chiropodists are on the staffs of about 1,000 hospitals throughout the country. The medical departments of the armed forces have created commissions for our professional services.

Charles Mayo¹ put the problem succinctly in these words: "I am convinced that doctors of medicine, myself included, have paid too little attention to the feet in their relationship to the condition of the patient, and have made too cursory an examination of the feet considering their importance to people, with the beating they take and their potentiality as a source of comfort or discomfort. The doctor of medicine should be capable of recognizing foot ailments. When care and treatment of such conditions are necessary, he should refer the patients to those accredited and skilled in the specialty when such consultation is available."

Ruben Friedman,² clinical professor of dermatology, Temple University School of Medicine, put it another way. "It has been estimated," he said, "that disorders of the feet occur in 80 per cent of women and in 60 per cent of men. Few practitioners of the healing arts are as familiar with the almost infinite number and variety as well as the significance of the symptoms and diseases of the pedal extremities as the chiropodist. Once he is engaged in active practice, the chiropodist sees more patients suffering from one form or another of diseases of the feet than does any practitioner of medicine."

Poindexter³ states, "In the field of chiropody, the practitioner is invaluable to the generalist, internist, or pediatrician treating such diseases as diabetes mellitus, cardiovascular diseases and arthritis. The orthopedist, neurologist, and surgeon have need for his services. Chiropody is more of medicine in a limited field, and this is all the more reason for an equivalent educational background. As a member of the Idaho Board of Examiners in Chiropody, as well as chairman of the State Board of Medicine, I have had the opportunity to write questions for your examinations and to correct them. The caliber of the papers is exceptionally good, and from them any physician could learn of your background, but it is difficult to communicate this in a satisfactory way."

Editorial comments in the *Canadian Medical Association Journal*⁴ stated: "Morton, who can speak with authority, holds that 'The foot is the only part of the body for which prevailing ideas of care and treatment have remained practically the same for 40 years.' Signs are not wanting, however, to show that the lag of which Morton complained is being gradually overcome. More and more textbooks are dealing with the feet, and chiropody is slowly but surely establishing itself. The chiropodist is no longer only one who extracts corns, useful as that may be. He

is now a trained professional man with professional and ethical standards like our own and based on rigid training. He specializes as does the dentist, on a limited field of the body outside of which he does not venture."

Those of us who specialize in the feet feel that we deal with, as Morton described, the most neglected phase of medicine today. Some of us suspect that much of the stress and strain of modern living, as emphasized by Selye and his workers, can possibly be traced to the use and abuse of this organ. For those physicians who might doubt this, I would suggest you examine the feet of all patients as carefully as you would the liver, lungs, heart, etc. Many of your patients suffering fatigue, leg-back ache, nervousness, may present something as simple as a deep plantar heloma. If you question the significance of this finding, you yourself might try walking a few days with a stone taped to the plantar of the great toe joint. We sincerely believe the old axiom, "When your feet hurt, you hurt all over," has greater significance than we dared think.

We would like for you to believe the modern chiroprapist fills a definite need in the medical-orthopedic fields and is well fitted to assume the responsibilities of caring for the nation's feet. It is not suggested that all current practitioners of chiropody are necessarily competent or modern, but I urge the discerning physician to evaluate the chiroprapist in his community and, whenever possible, employ his services in promoting the foot health of the American people. Chiropody needs, seeks and hopes to earn the cooperation of medicine.

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4. Editorial Comment: *Canadian Medical Association Journal* (Sept.) 1953.

BLUE SHIELD

"A strong Blue Shield is vital to the freedom of medical practice, and an understanding physician is vital to Blue Shield." This was the underlying theme of a highly successful professional relations conference held by the national association of Blue Shield Medical Care Plans in Chicago, February 11-13.

Some 110 Blue Shield professional relations directors and staff members were joined by more than 70 physician-trustees of local Blue Shield plans and 35 executive secretaries of sponsoring county and

state medical societies. The conference was conducted by the national Blue Shield Professional Relations Committee, whose chairman is Dr. Fredrick H. Good of Denver, president of the Colorado Blue Shield Plan.

Keynoter of the conference was Dr. Robert L. Novy, of Detroit, national president of Blue Shield Medical Care Plans, who emphasized that the ideals and purposes of Blue Shield are precisely the same as the age-old ideals and purposes of medicine: to serve people singlemindedly, regardless of personal profit.

"Blue Shield safeguards the basic freedoms of medical practice which are fundamental to good medical care," Dr. Novy said. "Blue Shield hopes to strengthen the doctor's traditional way of practicing medicine, not to change it or destroy it. Blue Shield protects the patient's right to choose his doctor, the doctor's right to accept or reject the patient, and their common right to an inviolate confidential relationship."

Dr. Novy pointed out that in the 15 years since Blue Shield was created, a whole new generation of doctors has come into practice who know nothing of the struggle and sacrifice of its founders. Many of these doctors take Blue Shield for granted, and the success of Blue Shield has even led many of their older colleagues to take it for granted, too.

Indifference, apathy, and complacency can be fatal to Blue Shield and to the whole voluntary medical care prepayment program. "Blue Shield deserves the doctor's whole-hearted support because it is fashioned in the doctor's own image; it is his own creation; and it is designed to strengthen the freedoms that he and his patients want to keep strong and safe," Dr. Novy concluded.

Dr. Francis Collins, Topeka, president of Kansas Blue Shield, Dr. E. Burke Scagnelli, Dodge City, and Dr. James B. Fisher, Wichita, were representatives of the Kansas Blue Shield board at the Chicago conference. Other Kansans attending included Rueben Dalbec of the Kansas Medical Society staff, Proctor Redd, director of public and professional relations of Kansas Blue Shield, and Tom Reed, manager of physician relations of Kansas Blue Shield.

More babies are being born in hospitals and with a doctor in attendance than ever before, Health Information Foundation reports. In 1935 only 37 per cent were born in hospitals, and 13 per cent of all births were unattended by doctors. In 1956 almost 95 per cent were hospital-born, and doctors attended 97 per cent of all births.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

By approximately the mid-term point in its first session, the 85th Congress had shown enough interest in health legislation to hold a variety of hearings, but there was no evidence that many major bills would be passed before adjournment.

Actually, it was not until three months after the session opened that the Administration sent up to Congress two bills it regards as important—one would change the doctor draft act and the other would authorize small commercial companies to pool part of their resources to stimulate expansion and experimentation in health insurance.

Even then, the Department of Health, Education, and Welfare had not released its draft of legislation for federal grants to medical, dental, and osteopathic schools for construction and equipment. On this, there was some reluctance to act until Capitol Hill had decided on the administration's bill for U. S. aid to general education.

Of all these bills, indications were that progress was assured on only one, that providing some revised arrangement for the selective draft of physicians, dentists and "allied specialists." The special doctor draft act, in effect for almost seven years, is scheduled to expire on July 1. Because Defense Department insists it still needs special authority to draft physicians and other professional health personnel by professional classification, the alternative was continuation of a modified doctor draft act or changing the regular draft act.

Meanwhile, a number of other bills had been studied at hearings. They include:

Changes in medical aspect of civil aviation regulations. Witnesses are widely divided on this measure that would set up an Office of Civil Aviation Medicine within the Civil Aeronautics Administration and give the Air Surgeon General who would head the office considerably more authority than now is exercised by U. S. medical officials in this field. There was no official sponsorship of this from the federal government level. It was opposed by the Department of Commerce (where CAA is located) and the Civil Aeronautics Board. However, support came from the outside, including testimony from Dr. Jan Tillisch of the Mayo Clinic, Dr. William Ashe, chairman of the department of preventive

medicine, Ohio State University, and Dr. Herbert F. Fenwick, president of the Civil Aviation Medical Examiners. Dr. Tillisch headed an AMA *ad hoc* committee that had started a study of the problem, but he testified as an individual.

Veterans medical care. The House Veterans Affairs Committee had held extensive hearings on a bill to further restrict admission of non-service connected cases to Veterans Administration hospitals, but there were no developments beyond that to encourage sponsors of this legislation.

Civil defense reorganization. Here again a wide split developed at the hearings on just how to reorganize the federal government's participation in civil defense. The administration wanted to strengthen the U. S. civil defense arm (the Federal Civil Defense Administration), but without going to the extent of making a cabinet-rank Department of Civil Defense, which is the goal of Chairman Chet Holifield (D., Calif.) of the subcommittee that had studied civil defense for more than a year.

Control of barbiturate and amphetamine drugs. The objective of bills before the House Interstate Health Subcommittee is to extend federal control to take in the manufacture, compounding, processing, distribution and possession of habit-forming barbiturates and amphetamines.

Pressures for economy that had been evident early in the session seemed to lose their effectiveness when Congress really set to work on the budget for the Department of Health, Education, and Welfare. Whereas in first (non-record) votes the House cut scores of items, it simply reversed itself when roll-call votes were demanded in the final go-around.

As an example, no reductions at all were made in funds for the research institutes, \$50 million was restored for grants to help build water pollution treatment plants, \$1.3 million was restored to the Food and Drug Administration. A \$5 million cut in money for general public health grants to states was sustained by the House—but this money will have to be provided later if the House estimate of the extent of the obligation proves too low.

Economy advocates tried without success in the House to cut \$21 million off money for the Hill-Burton hospital construction program.

While in theory the Senate is privileged to make its own cuts in a money bill coming to it from the House, in practice the Senators generally restore much of the money cut by the House and occasionally (as last year) vote large boosts over House figures. So the possibility now is for even higher health and medical budgets before the appropriations bills finally are enacted.

Clinicopathological Conference

Case Presentation

The patient for discussion in this conference was a 54-year-old white man who had been in a stuporous state for 12 hours before his admission to this hospital on September 29, 1956, at 8:00 a.m. He died on October 7, 1956, at 12:10 a.m. About a month before his admission he had had fever and chills and he was treated by his physician for a "kidney infection." On September 18 he had had an episode of vomiting and began to lose weight.

In 1946 he had had a laminectomy for a spinal cord tumor at the eighth thoracic segment, which left him with paraplegia. He had been confined to a wheelchair since that time and had had numerous decubiti. He had been incontinent of urine and feces for about seven days before admission. The night before his admission he was found in a stuporous state by his ten-year-old son with whom he lived.

No reliable family history or system review could be obtained.

On admission he was semicomatose, dehydrated, and cachectic. His blood pressure was 80/50; pulse, 100 and rhythmical; respiration, 24 per minute and deep. There were large, maggot-covered decubiti over the buttocks and both greater trochanters, and there was a superficial, necrotic ulcer with extensive surrounding cellulitis on the left thigh. Pitting edema of the left leg was present. The eyes, ears, nose, and throat were considered normal. The neck was supple. Nothing abnormal was found in the examination of the heart and lungs. The liver was palpable three centimeters below the costal margin, and it was hard. There was a first degree rectal prolapse with fecal impaction.

The specific gravity of the admission urine specimen was 1.010. No sugar was found, but there was a heavy cloud of albumin, 5 or 6 white cells, and 10 to 20 red cells per high power field. The red count on admission was 3,180,000 with 9.0 gm. hemoglobin, and the white count was 29,200 with 87 per cent polymorphonuclears and 10 per cent lymphocytes. There was little change in the urine during his hospitalization except for a slight reduction in albumin. The specific gravity ranged from 1.007 to 1.010.

On October 5 the hemoglobin was 6.8 gm.; the white count was 7,900; the platelet count was 132,-

000, and the reticulocyte count was 3 per cent. A Kahn test was positive with 8 units. Admission electrolytes were: sodium, 140 mEq/L; potassium, 3.8 mEq; chloride, 105 mEq; carbon dioxide, 20.3 mEq. The carbon dioxide was 29 mEq on October 1 and steadily decreased to 13.5 mEq on October 5. Serum electrolytes were determined daily, and the sodium and chloride values remained normal. On October 2 the potassium was 2.7 mEq, rising to 5.6 mEq on October 6. The fasting blood sugar was 128 mg. per cent on admission and 70 mg. per cent on October 4. The creatinine was 2.3-2.0 mg. per cent. The initial blood urea nitrogen was 95 mg. per cent, falling to 57 mg. per cent on October 6. Serum calcium was 4.2, and the phosphorus was 2.2 mEq/L. The serum albumin was 2.8 gm. per cent; globulin, 3.0 gm. per cent; total cholesterol, 88 mgm. per cent with 19 per cent esters; serum iron, 38 mcg. per cent; thymol turbidity, 23 units. The total bilirubin was 0.7 mg. per cent on admission and 1.5 mg. per cent on October 1 with 0.8 mg. per cent direct bilirubin. The acid phosphatase was 0.2 millimol units. The daily urinary sodium excretion rose from 5.9 to 20 mEq, and the potassium excretion increased from 14 to 70 mEq. The histoplasmin complement fixation test was negative. *Candida albicans* grew on three urine cultures, and *pseudomonas*, *paracolon*, and *proteus* were each recovered once. Two blood cultures were negative.

The patient was given intravenous fluids, and potassium chloride, chloramphenicol, and novobiocin were administered by mouth. He soon began to take fluids orally, and his sensorium cleared, but his temperature rose to 101.5 degrees and remained elevated. His combined oral and intravenous fluid intake was 2,500 to 4,500 ml. daily. His urinary output was 1,800 to 2,200 ml., and his stools were a normal color and contained no blood.

Twelve hours before death there was a sudden drop in the patient's blood pressure to 60/20. In spite of transfusions, digitalization, and general supportive measures, including adrenal steroids, he became worse and died quietly at 12:10 a.m. on October 7, 1956.

Roy R. Hieger (fourth year medical student): Dr. Purinton, was there a prothrombin time determination?

Dr. Lew W. Purinton (resident in medicine): No, there was not.

Mr. Hieger: What was the blood ammonia?

Dr. Purinton: It was not run.

Lawrence Hayes (fourth year medical student): Were steroids given during the hospital course?

Dr. Purinton: Only terminally.

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

Jess W. Koons (fourth year medical student): Did the patient vomit?

Dr. Purinton: Not during his hospital stay.

Richard Helm (fourth year medical student): Was there any evidence of gastrointestinal bleeding terminally?

Dr. Mahlon Delp (moderator): Dr. Weber, do you know of any?

Dr. Robert Weber (internist): No.

Frank J. Kutilek (fourth year medical student): What was the patient's highest blood pressure?

Dr. Purinton: Some blood pressure readings were as high as 100/60.

Lawrence Silvey (fourth year medical student): Do you know anything about his blood pressure before his admission?

Dr. Delp: Do you know anything about this, Dr. Weber?

Dr. Weber: No, I do not.

Mr. Hieger: Was the antibiotic therapy changed during the hospital course?

Dr. Purinton: No. He had the same treatment throughout.

Mr. Hieger: Did he continue to have tachycardia?

Dr. Purinton: Yes, he did.

Mr. Koons: Did he have a convulsion during the hospital course?

Dr. Purinton: I think that he had a grand mal seizure a short time before he died.

Mr. Kutilek: Was a spinal tap done?

Dr. Purinton: No spinal tap was done.

Mr. Helm: What was his temperature curve during the hospital course?

Dr. Purinton: He came in with a normal temperature, and it remained essentially normal for 24 hours. By the end of the second day his temperature was up to 101.6 degrees, and the following day it reached 103.6. On the fourth day it rose to 104 de-

grees where it stayed until two hours before his death, when it came down to normal.

Mr. Helm: Did you notice any improvement after his admission?

Dr. Purinton: He definitely improved during the first two days.

Mr. Silvey: How was his spleen?

Dr. Purinton: It was not palpable.

Mr. Silvey: Do you think he was an alcoholic?

Dr. Delp: Do you think he was an alcoholic, Dr. Weber?

Dr. Weber: I am not sure. His personal history is poor. He lived alone with his ten-year-old son.

Mr. Hayes: Were his lung fields clear during the hospital stay?

Dr. Weber: During the last 24 hours there were rales.

Mr. Hayes: How much cortisone did he receive?

Dr. Delp: 100 mg. intramuscularly. If there are no other questions, Mr. Hayes will demonstrate the electrocardiograms.

Mr. Hayes: The first tracing was made on the day of admission (Figure 1). The rate is 100; there is normal sinus rhythm, and the intervals are normal. I interpret the arrhythmia in V_1 to be a true extrasystole. The progression of the QRS complexes across the chest leads is normal. The second tracing was made on the fifth hospital day. The rate is 100; there are premature contractions in the V_2 and V_5R . The P-R and Q-T intervals are within normal limits. I interpret this as a normal electrocardiogram with the exception of the premature ventricular contractions.

Dr. Delp: Do you see any change in the T waves of the first tracing?

Mr. Hayes: There is a depression of the T waves.

Dr. Delp: Dr. Crockett, do you have any comments?

Dr. James E. Crockett (cardiologist): There have been some changes in the T vector, with a shift to the left. There are premature ventricular contractions. I do not know what is responsible for them.

Dr. Delp: Do you have any explanation for the T wave changes, Mr. Hayes?

Mr. Hayes: I would consider electrolyte imbalance and cardiac ischemia.

Dr. Delp: Mr. Koons, please demonstrate the x-rays.

Mr. Koons: The first chest film (Figure 2) taken on the day of admission shows the osteoporosis that one might expect. The costophrenic angles are clear; the heart is not enlarged. There is a well defined shadow which I interpret as being a calcific pleuritis. The next chest film was taken on his fourth hospital day. I believe there is no essential change here, but some points need to be clarified: the pa-

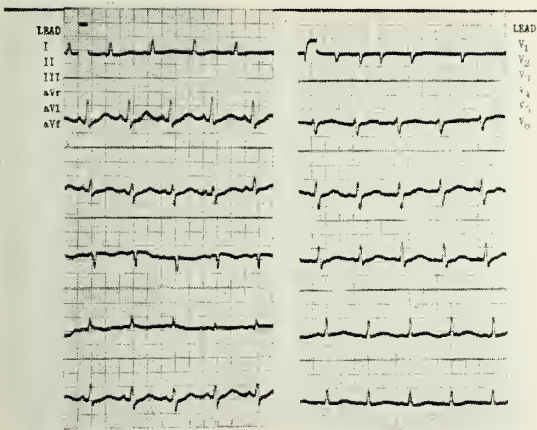


Figure 1. Electrocardiogram made on day of admission.

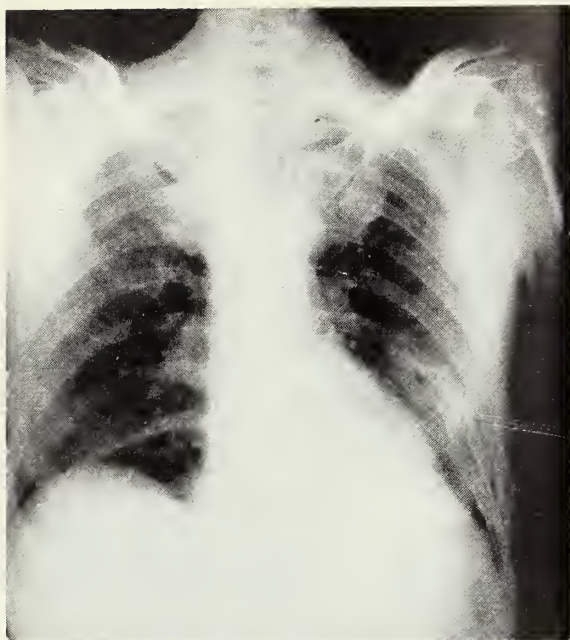


Figure 2. Chest film, taken on day of admission.

tient is rotated, giving the impression of an enlarged heart which I believe is an artifact. I do not see any important changes. The next film shows the marked osteoporosis, and there is evidence of flexion contractures of the thighs. There is evidence of an enlarged liver. I see no kidney or spleen shadows.

Dr. Delp: Dr. Youngstrom, do you have any comments?

Dr. Karl Youngstrom (radiologist): No, sir.

Dr. Delp: Mr. Hieger will now give his differential diagnosis.

Differential Diagnosis

Mr. Hieger: The case we have is that of a 54-year-old white man who was operated upon for a spinal cord tumor ten years ago, and who had been paraplegic since then. One month before his admission he had fever and chills, and he was treated for a kidney infection. On September 19 he began to vomit, and three days later he became incontinent of urine and feces. Twelve hours before admission he became stuporous. On admission he was hypotensive, semicomatose, dehydrated, cachectic, and paraplegic, and he was breathing deeply. Large maggot-covered decubiti were present over the buttocks and both greater trochanters. There was a necrotic ulcer on the left thigh with extensive surrounding cellulitis, and there was marked pitting edema of the left leg. The liver was hard and palpable 3 cm. below the costal margin.

The originating factor in the pathogenic sequence was a spinal cord tumor, which statistically should

have been extramedullary, either a meningioma or a neurofibroma. More than 80 per cent of paraplegics die of various complications; chronic renal failure is a common one. In this case certain other causes of coma must be considered. They are trauma, drugs, poisons, infections, brain tumor, and endogenous toxins. Trauma, drugs, and poisons I rule out on the basis of the history. Although this patient had infections in various foci, I think that they were not the cause of his presenting complaint. Brain tumor is unlikely, although there was evidence of increasing intracranial pressure. Endogenous poisoning may cause coma as in diabetes, but the laboratory results do not support this diagnosis, and I rule out cholemia because he was not jaundiced.

The diagnosis of uremia is suggested by the history, supported by clinical impression, and verified by laboratory findings. I shall therefore devote my discussion to complications of paraplegia, the most common and possibly the worst of which are: decubiti, chronic pyelonephritis, renal failure with uremia, poor nutrition, and psychological dependence, all of which this patient had. I believe that he had a cord bladder resulting in residual urine, hydronephrosis, and pyelonephritis, which had been smoldering over a period of ten years with acute exacerbations.

I cannot rule out the possibility of nephrolithiasis, but no stones were seen in the x-rays. I believe that infection precipitated uremia in this patient who already had damaged kidneys. He was in acidosis at the time of death. The acidosis was, I believe, secondary to his excessive vomiting, and resulted in Kussmaul breathing. He was treated with antibiotics and intravenous fluids, the latter of which introduced foreign elements into his blood. The drainage of the bladder by catheter probably contributed to the depression of his blood urea nitrogen. However, he did poorly on this regimen. Fever developed and continued as evidence of his state of toxemia. His urinary output was inadequate, and the kidneys were unable to concentrate urine.

The patient's stupor was, I believe, caused by a number of factors, among which were toxic and hypertensive encephalopathy complicated by hypotension, anemia, dehydration, and severe infection. Another important complicating factor was inadequate nursing care during a period of ten years. His general nutrition was inadequate and may have resulted in nutritional cirrhosis as suggested by the hepatomegaly and altered liver function tests.

His condition remained essentially the same until the eighth hospital day when he developed shock and Cheyne-Stokes respiration and had a convulsion. He died in spite of transfusion, digitalization, and supportive therapy. His death can be explained in a

number of ways. He might have had pulmonary embolization, as he obviously had thrombophlebitis in his left leg. On the other hand he was not cyanotic, had no chest pain, and survived for 12 hours after the onset of hypotension. Hemorrhage with cerebral edema must also be considered, because vascular lesions secondary to uremia and hypertension predispose to this. Cerebral hemorrhage cannot be ruled out, because a spinal tap was not done. The urinary output was good, and I do not think that he had hyperkalemia, nor did he have a myocardial infarction during the final episode. In the absence of edema and tachycardia, I do not believe that he had acute cardiac failure. The terminal episode is best explained by diffuse central nervous system involvement, with focal edema, softening and gliosis, and hemorrhages into the brain substance.

I also believe that he had secondary amyloidosis. The factors complicating this disease contributed to his demise. The hepatic enlargement, abnormal hepatogram and history of long-standing infection with the development of uremia and vomiting are more significant of amyloidosis than of nutritional cirrhosis.

I think this patient had chronic renal disease, uremia, and metabolic acidosis, all secondary to long-standing pyelonephritis which was complicated by secondary amyloidosis. The terminal episode was the result of diffuse encephalopathy and hemorrhage. Lastly, I would like to predict what the pathologists will show us: I believe we will see large, pale, waxy kidneys with evidence of acute and chronic pyelonephritis; a large, waxy liver; passive congestion of the liver, spleen, intestine, and lung; hyperemia and fatty depletion of the adrenals; organic vascular occlusion with focal and diffuse cerebral edema, and actual hemorrhage into the brain.

Clinical Discussion

Dr. Delp: Thank you. Mr. Keith, why did this patient have a convulsion?

Charles R. Keith (fourth year medical student): That can be explained by his prolonged hypertension.

Dr. Delp: Mr. Silvey, what do you think about that?

Mr. Silvey: I agree with that idea.

Dr. Delp: Mr. Koons?

Mr. Koons: I believe that the patient had emboli to the brain.

Dr. Delp: What do you think were the primary foci?

Mr. Koons: I was thinking of the leg. The patient had multiple decubiti, septicemia, and probably impairment of circulation.

Dr. Delp: Mr. Helm?

Mr. Helm: I think that the convulsion can be explained on the basis of general encephalopathy.

Dr. Delp: What do you mean by encephalopathy? That is a vague general term.

John D. Dougherty (third year medical student): I think the patient's hypertension led to cerebral infarct. He had renal hypertension which might lead to cerebrovascular hypertension with infarct and necrosis.

Dr. Delp: Mr. Keith, regardless of what Mr. Dougherty said, you can see in the patient's chart that he definitely had hypotension, not hypertension. How do you account for this hypotension?

Mr. Keith: I can explain it in several ways. He might not have been adequately rehydrated. Also he had toxemia, although his blood was relatively sterile. Finally, secondary amyloidosis may also account for it.

Dr. Delp: Mr. Kutilek?

Mr. Kutilek: I believe this man might have had adrenal insufficiency.

Dr. Delp: How do you make adrenal insufficiency out of this?

Mr. Kutilek: The patient had secondary amyloidosis which involved the adrenals.

Dr. Delp: Let's get back to the appearance of the patient when he came in. He had maggots in his decubiti. Any comment about that?

Mr. Kutilek: I think he had general poor management all the way along, but maggots are good debriders.

Dr. Delp: Now, let us go back to the period ten years ago and do a little guessing about what might have been the trouble with the patient at that time.

Mr. Keith: I believe that he had a benign extramedullary tumor then, which does not have anything to do with the present trouble.

Dr. Delp: Do you think that he lived as long as, or longer than, the average person with paraplegia?

Mr. Keith: After World War I, before antibiotics were developed, none of the large number of paraplegics was alive after five years, but since the advent of antibiotics 85 per cent of a group of paraplegics were alive after five years. This man lived ten years after the development of paraplegia.

Dr. Delp: Of course, there is no evidence that this man had not been receiving some kind of treatment. The amazing thing, however, is that he died. How long did he live after coming to the hospital?

Mr. Keith: He died eight days after admission.

Dr. Delp: Dr. Williamson, do you have any comments to make about this patient?

Dr. William Williamson (neurosurgeon): I did not remember this patient, but one of the relatives recognized me as the surgeon who had operated on him ten years ago. I then remembered that he had

had a meningioma of the spinal cord that was totally removed. It was surprising to me that he became paralyzed after he went home. He should have recovered completely. I could only think that I had either damaged the cord in the removal of the tumor, or the cord was so badly compressed that it could not recover. Because of the desperate condition he was in at the time of consultation, it did not appear safe to do any further neurological examinations such as spinal puncture.

It also occurred to me that this man suffered from complications as a result of lack of follow-up after operation. I had never seen him after he was dismissed from the hospital until I was called in consultation during his final illness. I suppose that it occurred to the family that he would just become paralyzed after he was operated upon; no one thought anything about it. I was the only one who felt disappointed that he was paralyzed as the result of lack of follow-up after an apparently successful removal of a meningioma.

Dr. Delp: Dr. Weber, the students are eager to hear from you.

Dr. Weber: This patient presented a rather difficult problem. He had jack-knife contractions of both legs, and it was impossible for him to lie in bed comfortably. He was admitted in a semicomatose state, and at that time he was afebrile. Part of our management consisted of removing the maggots, and after their removal he became febrile. Cultures of the decubiti revealed that he had staphylococcal infection. *Pseudomonas* and monilia were cultured from his bladder. We treated him with antibiotics: chloramphenicol, a rather wide spectrum antibiotic, was

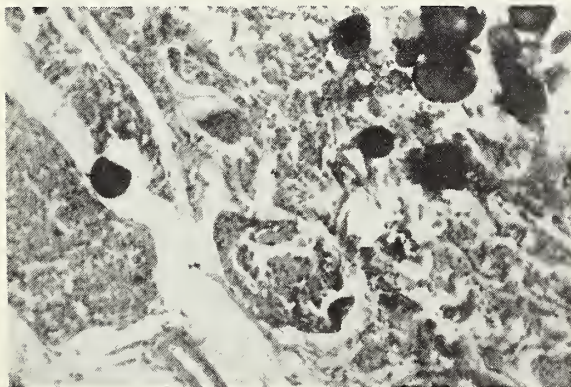


Figure 3. Section of meningioma found at autopsy at level of second thoracic vertebra. Tumor is histologically identical to that removed previously and to the third meningioma at the level of the third thoracic vertebra. Growth consists of islands and strands of meningothelial cells with numerous interspersed psammoma bodies (dark, round calcified bodies). Hematoxylin and eosin stain, X130.

used, and novobiocin was also administered on the assumption that he probably had hospital organisms.

I think he died of hypotension secondary to his toxicity and infection. I expected when he was admitted that we would find renal stones or bladder stones. Here was a patient who had been ill and lying in bed for a period of ten years. I was sure he had severe osteoporosis and possible deposition of calcium in the kidneys and bladder. He also had a cord bladder, hydronephrosis, and renal infection with uremia. I diagnosed this as a combination of renal failure and infection.

The situation was at no time encouraging about rehabilitating the patient because of the serious infections that he already had, and, with the decubiti, it was difficult to handle him. My impression, after seeing the x-rays and noting that he did not have stones, was that he had chronic pyelonephritis and infections secondary to the superficial lesions on the skin. He probably did have bacteremia. Terminally, we used cortisone as a desperate attempt to combat his hypotension.

Dr. Delp: May we hear about the pathology?

Pathological Report

Dr. Harlan Firminger (pathologist): You have already heard the description of the external appearance of this man which was not changed when he came to autopsy.

In the history there was a previous operation nine or ten years ago, at which time a tumor was removed from approximately the level of the eighth thoracic segment. Examination of the specimen revealed a meningioma (Figure 3). The main cellular elements were meningothelial cells growing in the form of whorls, which at times were hyalinized and frequently produced sand-like grains of calcific material.

In the area of the previous operation there was considerable scarring, but there was no adherence of fibrous strands to the spinal cord. If we had not had the history and external scar, we might not have known that anything took place at that level. In the sections of the spinal cord taken below the level of the previous operation, that is at the level of the tenth thoracic segment, stains for myelin sheaths of the nerves revealed perfectly intact posterior columns, but there was loss of the anterior and lateral corticospinal tracts (Figure 4C). At a section higher up, at the level of the first thoracic vertebra, there was degeneration of the fasciculus gracilis. The fasciculus cuneatus was intact (Figure 4A). There was some loss, but not so clearly demarcated, in the spinotectal, spinothalamic and spinocerebellar tracts. The anterior column was intact, and the lateral column was well myelinated. Thus the ascending de-

generation in the region of the first thoracic vertebra and the descending degeneration in the lower thoracic region represented the result of transection in the thoracic region.²

It would be logical to conclude that this was the result of the old meningioma; however, at autopsy we found two more meningiomas at the level of the second and third thoracic segments, respectively, which were morphologically identical to the original tumor (Figure 3). The question now arises as to which of the meningiomata really produced the paraplegia. The answer lay in sections taken between the level of the previously excised tumor and that of the meningioma found at autopsy. A section taken from the level of the fifth thoracic segment (Figure 4B) showed that the fasciculus cuneatus in the dorsal columns were intact, and there was anterior and lateral corticospinal loss, which indicates that the real lesion producing the damage lay above the level of the meningioma that was removed, and that the paraplegia was actually caused by the meningiomas at the second and third thoracic segments.

In addition, there was degeneration of peripheral nerves. Ordinarily we do not expect peripheral nerves to degenerate when there is transection of the spinal cord. A section of the sciatic nerve stained with the myelin stain showed that most of the myelin sheaths were destroyed, indicating peripheral nerve degeneration, too. We attribute this to a nutritive type of peripheral neuritis and not to transneuronal degeneration.

As the result of the lack of stimulation from the nervous system, the muscles of the leg underwent atrophy, and in the section of one of the hamstring muscles one can hardly recognize it as muscle (Figure 4D). There is connective tissue and fat replacing the muscle; here and there are groups of multi-

nucleated muscle cells representing proliferation of sarcolemmal nuclei, but almost no intact muscle.

A section of the base of the decubital ulcer revealed extensive invasion of the tissue by masses of bacteria extending deep into the subcutaneous fat and surrounded by inflammatory cells with a great deal of necrosis.

Mr. Hieger emphasized that urinary tract infection is often the main source of trouble in paraplegics, and the section of his thickened bladder showed areas of ulceration and hyperemia of the mucosa. The necrotic debris in the base of the ulcer contained *Candida albicans* or something closely resembling it.

The major question that arose in our mind was, "What was going on in the kidneys?" By all odds, and by all that we have learned, it should have been chronic pyelonephritis. However, at the time of autopsy, instead of finding small kidneys, we found that they were large and pale, somewhat resembling amyloid kidneys, as Mr. Hieger suggested. The cortex was markedly thickened and pale. There was some congestion of the cortico-medullary junction with focal areas of congestion within the kidney substance. Microscopically, this was thought to be an interstitial nephritis simply because it did not fit anything else we know. The glomeruli were mostly intact. There were no areas of scarring. Instead there were patchy areas of chronic inflammatory infiltration consisting of lymphocytes, many plasma cells, and mononuclear cells with almost no polymorphonuclear cells participating. There did not seem to be anything acute in most of the lesions, and the striking thing was in the tubules which showed a moderate amount of degenerative change with albuminous casts. This lesion was primarily a nephrosis but with its inflammatory component, for want of

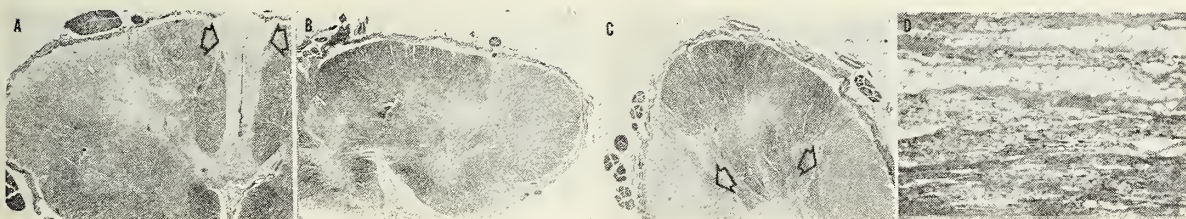


Figure 4A. Spinal cord section at level of first thoracic vertebra. Note loss of myelinated fibers in the fasciculus gracilis of the posterior column between the arrows. The fasciculus cuneatus is intact. Luxol fast blue stain for myelin (appears dark on photograph). X12.

Figure 4B. Spinal cord section at level of fifth thoracic vertebra reveals no loss of myelin in posterior column but some loss in lateral column, as in Figure 4C following and in the anterior column (not shown in 4C). Luxol fast blue stain for myelin. X9

Figure 4C. Spinal cord section at level of tenth thoracic vertebra showing demyelination of lateral columns indicated by arrows. The posterior column is well myelinated. The anterior column, not shown, also was partially demyelinated. Luxol fast blue stain for myelin. X12.

Figure 4D. Note the atrophy and loss of striated muscle with replacement by connective tissue and adipose tissue. Hematoxylin and eosin. X85.

a better term, we have called it interstitial nephritis. We proposed that this was related in some way to a chronic or subacute lower nephron nephrosis.

There was an ulceration and necrotic material in the cardia of the stomach at its junction with the esophagus. Under high power we found that this contained a mass of fungi resembling *Candida albicans* with inflammatory reaction about it. The periodic acid-Schiff stain showed the fungus distinctly with underlying reaction to it. It was entirely similar to the lesions in the urinary bladder. This certainly represented a surface type of infestation rather than dissemination by the blood stream.

Finally, the adrenal glands showed marked exhaustion. The adrenal cortex was hardly recognizable. It had a tubule-like formation of cells almost completely devoid of fat and falling apart with loss of cells and edema. We were unable to demonstrate amyloid anywhere.

In summary, this was a man who had a meningioma ten years ago, which, unfortunately, was not the only meningioma he had. He had two others which did not grow notably, but continued to compress the cord and produced his paraplegia. They were identical in morphology with the original lesion, and this raised the question whether or not they could represent dissemination at the time of operation. Kernohan and Sayre³ reported a case of meningioma in a muscle of the head which apparently was the result of implantation at the time of removal. This is a possibility, but I believe that it is quite unlikely, despite the similarity in morphology. Multiple meningiomata are not at all rare, and I believe that this is what this case represents. It is clearly not a malignant tumor, and it has not disseminated in that manner. There are cases of diffuse meningiomatosis in which one has multiple plaques all through the meninges,¹ but this case certainly does not fit into that category.

As a result of his meningiomata he developed paraplegia, and this was his chief complaint until considerable infection developed. The toxins from his infection must have had a lot to do with the development of his renal disease; perhaps his hypotension also contributed. It was fundamentally a subacute type of lower nephron nephrosis with casts, loss of albumin, loss of tubular function as evidenced by increasing loss of sodium and potassium, which suggests a lack of tubular reabsorption.

Finally, he developed a moniliasis, possibly as a result of the antibiotic therapy. He had a small focus of pneumonia, but I think uremia was the major factor in bringing about his death.

Mr. Hieger: What about the liver?

Dr. Firminger: The liver was large, as you suggested. It weighed over 2,300 gms. It showed very little fat. There was a slight increase in the fibrous

tissue in the portal areas, and small numbers of chronic inflammatory cells, chiefly lymphocytes and plasma cells. There was not enough increase in fibrous tissue to call it cirrhosis, and not enough fat to explain the enlargement on the basis of fatty metamorphosis. I do not know exactly why it was enlarged. It was diffusely congested.

Dr. Delp: Dr. Poser, do you have any comments to make about this case?

Dr. Charles M. Poser (neurologist): I think it is worthwhile to emphasize the care of the paraplegic patient, and this applies to any patient with paraplegia. As Mr. Hieger pointed out, since World War II there has been a great improvement in the care of the paraplegic. The general care of the patient is primarily prophylactic; once the decubiti are present they are difficult to manage. Secondly, the metabolic problem is of importance in these patients because the metabolism of protein has to be maintained. They usually have the problem of calcium deposit in sundry places as the result of skeletal decalcification secondary to protein loss in the skeletal stroma. Continuous care, therefore, depends on the control of metabolism, the care of the urinary tract, and physiotherapy. Control of infection is of primary importance, and if this man had been well taken care of there is no reason why he should not be living today.

Dr. Delp: Any further question or comment?

Dr. Williamson: I would be inclined to favor multiple meningiomata instead of transplant because there was no recurrence of the tumor at the site of operation. Furthermore, the lesions were far apart. I believe that he did have multiple meningiomata, and I am sure the upper one was there at the time I operated on the lower one. When we did the myelogram it filled up at the level of the eighth thoracic segment, and we removed the tumor. We did not do another myelogram after surgery, but assumed that it was all right. Had the patient reported after the operation with more complaints, we would certainly have reinvestigated to find out whether there was another tumor higher up, and we would have removed it, because it was surgically curable.

Pathological Anatomical Diagnosis

Two psammomatous meningiomata compressing the spinal cord at the levels of the second and third thoracic segments, with degeneration of the fasciculi gracilis and dorsal spinocerebellar tracts proximal to, and the anterior and lateral corticospinal tracts distal to the meningiomata.

Atrophy and fat replacement of the muscles of the lower extremities, moderate, with flexion contracture of the right hip and knee, advanced.

Osteoporosis of the lumbar spine, moderate.

Emaciation.

Degeneration of the ileoinguinal and sciatic nerves.

Multiple decubiti of the right thigh, the perineum, both buttocks, and over the right greater trochanter.

Acute hemorrhagic and chronic cystitis, moderate, with *Candida albicans* present in acute ulcers.

Diffuse interstitial nephritis, bilateral, advanced.

Acute passive congestion, all lobes of both lungs.

One focus of acute bronchopneumonia, lower lobe of right lung.

Hypertrophy and dilatation of the heart, 370 gm.

Acute passive congestion of the liver, moderate.

Fatty metamorphosis of the liver, slight.

Lipid depletion of the adrenal cortices, advanced.

Acute ulcerative esophagitis, with fungus organisms compatible with *Candida albicans* in the ulcerated areas.

Summary

Dr. Delp: This is truly a case to prove the continued value of the autopsy and careful reconstruction of the clinical picture upon a basis of the postmortem findings.

Treacherous multiple foci of meningiomata in the spinal cord assured failure of the original surgery when only one, and the less important lesion at that, was removed. Compounding the difficulty was the failure in follow-up at which time delayed correction might have occurred.

The usual chronic and recurrent urinary tract infections did occur here as is common in patients with paraplegia. However, this can be cited for a minor role only in the final cause of death. It is likely that the patient acquired several hospital organisms which were resistive to antibiotics, and soon had a fulminant bacteremia. The medical shock state following contributed greatly to the tubular damage appearing in the sections of renal tissue. The careful ridding of the decubiti of the maggots may have been the first step in destroying nature's original line of defense.

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American families spent about \$950 million in 1956 to pay the doctor, hospital, and other maternity bills for the safer care of mothers and children in more than four million births, according to an estimate by Health Information Foundation. The average cost per family was \$225.

COUNTY SOCIETIES

Three guest speakers presented a program on the Jenkins-Keogh bill now in Congress at a meeting of the Sedgwick County Medical Society in Wichita on April 2. Mr. George Powers discussed legal aspects of the bill, Mr. C. Merritt Winsby, C.P.A., spoke on its actuarial features, and Mr. John H. Laffer described its insurance features.

Dr. Carroll P. Hungate discussed "The Role of the Physician in Mass Casualty Care" at a meeting of the Wyandotte County Society in March. For the program on April 16 Mr. Thomas C. Hurst, trust officer of the Commercial National Bank in Kansas City, spoke on estate planning.

A meeting of the Montgomery County Society was held at the Booth Hotel, Independence, in March. Dr. Jack Fair discussed work being done with mentally retarded children at the Parsons State Training School.

Present officers of the Miami County Society are Dr. W. O. Appenfeller, Osawatomie, president, and Dr. George Zubowicz, superintendent of the Osawatomie State Hospital, vice-president.

Dr. Robert W. Weber, of the University of Kansas Medical Center, spoke on "New Antibiotics" at a meeting of the Riley County Society held in Manhattan on March 20.

"Recent Trends in the Law as They Relate to Medicine" was the subject discussed by Mr. Hugh P. Quinn, Wichita, at a meeting of the Shawnee County Society in Topeka on April 1. At the business session the members approved a plan to give polio vaccine to all county residents under the age of 40 as a society project in cooperation with other community agencies.

Members of the Geary County Society were hosts at a meeting of the Golden Belt Medical Society at the Country Club in Junction City on April 11. Dr. G. Bernard Joyce, Topeka, spoke on "Congenital Orthopedic Deformities," and Dr. John F. Christianson, Kansas City; Dr. Robert K. Wallace, Manhattan, and Dr. William E. Mowery, Salina, discussed "Treatment of Thyrotoxicosis."

A meeting of the Central Kansas Medical Society was held at Russell on March 14. Speaker of the evening was Dr. Don R. Miller, of the University of Kansas Medical Center, who discussed "Surgery of the Rectum and Colon."

PHYSICIANS' ACTIVITIES

Dr. Ellis Duncan, assistant professor of surgery at the University of Louisville School of Medicine, has announced plans to open an office for private practice in Burlington.

Three Wichita physicians, **Dr. A. M. Tocker**, **Dr. Charles DeHaan**, and **Dr. B. E. Stofer**, are authors of a paper, "Primary Pulmonary Leiomyosarcoma," published in the March issue of *Diseases of the Chest*.

Dr. Robert M. Fenton, formerly of Greensburg, is now practicing in Garden City.

Dr. Fowler B. Poling, Wichita, was guest speaker at a recent meeting of the Sedgwick County Medical Assistants' Society. He discussed "The Desirable Personality."

The commissioners of Jefferson County have named **Dr. Robert R. Snook**, McLouth, health officer to replace **Dr. C. J. Bliss**, Perry, who recently resigned.

Dr. William R. Miller, who has been practicing in Axtell, recently moved to Summerfield, a town in which he had been located before going to Axtell.

Announcement has been made by **Dr. Richard E. Hille**, who has been practicing in Garden City since September, that he will soon establish his practice in Lakin. He is a graduate of the University of Kansas School of Medicine.

Dr. Frances Allen, Newton, **Dr. William E. Larsen** of the University of Kansas Medical Center, and **Dr. Robert P. Norris**, Wichita, took part in the program presented at Wichita, May 6 and 7, at the annual convention of the Kansas Society of Medical Technologists.

"Diseases of the Liver" was the topic chosen by **Dr. Samuel Zelman**, Topeka, for an address given to medical technologists of the northeast district of Kansas at a meeting held in Topeka last month.

Dr. A. R. Chambers, Iola, a member of the Kansas House of Representatives, addressed the Kiwanis

Club in Iola during the recent legislative session and explained the basic science bill and the healing arts bill then under consideration by the House.

Dr. Mary Glassen, who had practiced in Phillipsburg for 23 years, announced her retirement on March 1. At the same time she announced that **Dr. Thomas F. Taylor**, who had been practicing with her since last summer, is now associated with **Dr. V. W. Steinkruger**, **Dr. R. J. Koza**, and **Dr. G. L. Osborne** for group practice in Phillipsburg. Dr. Osborne formerly practiced in Clay Center.

A feature story in the *Wichita Beacon* recently described the life of **Dr. L. Clair Hays**, Cedar Vale, who flies a plane to conserve time in his practice, in the conduct of ranching activities, for vacations, and for visiting uranium claims in Wyoming. Dr. Hays flies a Beech Bonanza and has four runways at his private airport on his ranch.

Dr. W. R. Beine, Coffeyville, has been appointed to the Coffeyville Board of Education to fill an unexpired term.

New in Emporia is **Dr. Ronald J. Daniels**, a graduate of Creighton University School of Medicine who has been practicing internal medicine at the Veterans Administration Hospital in Omaha during the past year and a half.

Dr. Arnold H. Greenhouse discussed the cooperation of ministers and doctors in caring for the sick at a joint meeting of physicians and ministers in Garden City recently.

"Mental Health" was the subject discussed by **Dr. Lewis L. Robbins**, of the Menninger Foundation, at a recent meeting of the Woman's Auxiliary to the Shawnee County Medical Society, Topeka.

Dr. Robert E. Stowell, of the University of Kansas Medical Center, recently spent a week at the Armed Forces Institute of Pathology, Washington, as a consultant. He also gave a lecture, "Chemical and Histo-Chemical Changes of Liver Cells during Necrosis."

Plans to practice in St. John after July 1 have been announced by **Dr. Ross Jewell**, a graduate of the University of Kansas School of Medicine who is now serving his internship at Wesley Hospital, Wichita.

Dr. J. R. Bradley recently resumed practice at the Bradley-Waldorf Clinic in Greensburg after completing two years service with the Air Force in Tampa, Florida.

Dr. Thomas G. Orr and **Dr. Stanley R. Friesen**, of the University of Kansas School of Medicine, are authors of a chapter on "Hemorrhagic and Traumatic Shock" in a recently published edition of *Lewis' Practice of Surgery*.

Dr. Paul H. Beckman, a graduate of the University of Tennessee Medical School who has been interning at St. Francis Hospital, Wichita, has announced plans to practice three days a week in Douglass.

A former resident of Grand Island, Nebraska, **Dr. Theodore E. Wade**, recently opened an office in Liberal.

Dr. Homer L. Hiebert, Topeka, was a guest speaker at a refresher course on isotopes given by the Kansas Society of X-ray Technicians at Wichita last month.

Dr. Ralph H. Major, professor emeritus of medicine at the University of Kansas Medical Center, spoke on "How Hippocrates Made His Diagnoses" at the Medical College of Georgia on April 25. The occasion was a meeting of the Georgia chapter of Alpha Omega Alpha.

Dr. Mary Glassen, Phillipsburg, was one of the speakers at a meeting of the National Federation of Press Women at San Antonio on April 18.

A Budapest physician who fled Hungary in February, **Dr. Imre Fenyes**, was brought to Kansas through having heard the name of the late Dr. A. E. Hertzler and is now living in Halstead. He is working in the laboratory at the Halstead Hospital and plans to become licensed to practice medicine here as soon as possible.

A paper, "The Second Stage of Labor," was presented by **Dr. L. A. Calkins**, of the University of Kansas Medical Center, at a meeting of the Tulsa Obstetrical and Gynecological Society on March 13.

Dr. Gerald L. Ward, Ellis, spoke on mental health at a meeting of the Y.W.C.A. at Ellis recently.

Two Lawrence physicians presented a program at a recent meeting of the Cordley Parent-Teacher Association in Lawrence. **Dr. Helen M. Gilles** spoke on nutrition, and **Dr. M. Erik Wright** discussed emotional development.

Dr. Melvin L. Masterson, who has been practicing in Louisburg, has announced plans to move to Paola to practice in association with **Dr. Jack Rowlett** and **Dr. Rex Stanley**.

Dr. Arnold V. Arms, of the University of Kansas Medical Center, has been notified by the ministry of foreign affairs in Santiago, Chile, that he has been appointed honorary consul for Chile in Kansas City.

Plans to move to Lindsborg and to construct an office building there have been announced by **Dr. Deryl D. Fuller**, who has been practicing in Marquette.

A newcomer to Kansas is **Dr. Necati Erdentug**, now practicing in Anthony. Dr. Erdentug, who has studied in England, Norway, Sweden, Denmark, and Turkey, came to Kansas from Nashville, Tennessee.

Dr. John W. Turner, Garden City, spoke on "What's New in Medicine" at a recent meeting of the Cultura Club there.

Dr. J. E. Seitz, WaKeeney physician since 1948, has announced plans to move to Ellsworth to practice in association with three others, **Dr. Richard H. O'Donnell**, **Dr. Henry S. O'Donnell**, and **Dr. Alfred J. Horejsi**.

A feature story about **Dr. James G. Lee**, Bonner Springs, was published in the *Kansas City Kansan* on March 17 in a column, "Just Lookin' Around." The story told of Dr. Lee's 60 years in practice.

Dr. Chauncey G. Bly, of the University of Kansas Medical Center, discussed cancer research at a recent meeting of the Johnson County unit of the American Cancer Society.

Dr. Bruno Minz, director of research and education at the Osawatimie State Hospital, was recently given the Godard Award by the French Biological Society in Paris. The award, given annually to the

scientist who has contributed most to the fields of biology and experimental medicine, was given Dr. Minz for his work in physiology. He is on leave of absence from the University of Paris, where he is a director of research, and is investigating the possible psychophysiological correlates of the major psychoses. He is devoting part of his time to teaching at the University of Kansas Medical Center, where he was recently appointed professor of pharmacology.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was the subject of a major story in the February issue of *The Palm*, publication of Alpha Tau Omega fraternity. The story was called "Manager of 'Medical City'" and was written by Conwell Carson for first publication in the *Kansas City Star*. Dr. Wescoe is referred to as "ATO's outstanding senior of 1941."

Dr. Edward Crowley, Wichita, presented a paper on maternal deaths in Kansas in 1956 at a section meeting of the American College of Obstetricians and Gynecologists in Dallas last month. **Dr. Jerome Menaker**, Wichita, presided at a luncheon seminar on pelvic congestion syndrome at the same meeting.

Dr. John B. Dixon, who has been practicing ophthalmology with the Wichita Clinic, has announced plans to enter private practice in Mason City, Iowa, on June 1.

Cryptococcosis

(Continued from Page 303)

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Medical Services

(Continued from Page 300)

the physicians practicing therein, are classed as specialists. Wichita has the greatest number and percentage of physicians who are specialists. There is a preponderance of physicians in the surgical specialties, as 425, or 44.8 per cent of the specialists in the state, are in this field, while 389, or 41 per cent, are in the medical field, and 134, or 14.2 per cent, in the other specialties.

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Two-Way Medical Communications

Physicians who attend the A.M.A. meeting in New York in June will be in direct two-way communication with physicians attending the Harvey Tercentenary Congress in London on June 5 through a hook-up arranged by Smith, Kline and French Laboratories, Philadelphia. An underseas cable will carry a discussion, "The Results of Cardiac Surgery."

Participants in New York will include Dr. Michael E. De Bakey, Dr. Alfred Blalock, Dr. John H. Gibbon, Jr., Dr. Frank L. A. Gerbode, and Dr. George E. Burch.

Legislative Key-Man System

As a means of promoting national legislative activities on a state level, the Committee on Legislation of the American Medical Association has selected a key man from each state to serve as a liaison between it and the physicians in his area. Dr. Clyde W. Miller, Wichita, was named to serve for Kansas.

In the future, whenever action is desired, the key man in each state will be contacted directly by a member of the Committee on Legislation. The key man, in turn, will pass on information to members of a legislative committee in his state.

DEATH NOTICES

LINDLEY EDGAR STRODE, M.D.

Dr. L. E. Strode, 84, who had practiced in Girard more than 56 years, died at his home there on February 27. A graduate of Hahnemann Medical School in Chicago in 1899, he opened his first office in Brazilton and practiced there for a year before moving to Girard. He was a member of the Crawford County Society.

CLAUDE E. BURTCH, M.D.

An honorary member of the Osborne County Society, Dr. C. E. Burtch, 82, died at his home in Portis on March 7 after having been ill for a year. He was graduated from University Medical College, Kansas City, in 1904 and began practice immediately at Athol. Five years later he moved to Paradise, and two years after that transferred his practice to Portis, where he built a hospital in 1925. He was especially interested in literature and music, and for a time he conducted an orchestra and taught instrumental music.

KARL C. HAAS, M.D.

Dr. K. C. Haas, 70, a Kansas City physician who also served as vice-president of the Kansas City Board of Education, died on March 13 at the University of Kansas Medical Center, where he had been a patient for two weeks. A graduate of Eclectic Medical University, Kansas City, Missouri, in 1910, Dr. Haas took postgraduate work at the Kansas City College of Medicine and Surgery. He practiced in Hays and Victoria before opening his office in Kansas City in 1917. He was a member of the Wyandotte County Medical Society and of the American Academy of General Practice.

Schools, offices of the education system in Kansas City, and libraries there closed as a tribute to Dr. Haas during the time of his funeral services. He had been a member of the Board of Education since 1940 and had been vice-president since 1947.

FRIEDRICH W. TRETBAR, M.D.

Death came to Dr. F. W. Tretbar, 76, an honorary member of the Stafford County Medical Society, on March 18 after an illness of

two years during which he was hospitalized at the Stafford Hospital. He had practiced in Stafford since 1910, and for five years preceding that date, after his graduation from Kansas City Medical College, had practiced in Hudson. He served nine years on the Stafford Board of Education, was a charter member and first president of the Lions Club in Stafford, and was active in many church and civic affairs.

MARK L. BISHOFF, M.D.

Dr. M. L. Bishoff, retired chief surgeon of the hospitals of the Santa Fe system, died on March 19 at Topeka, where he had made his home. He was an honorary member of the Shawnee County Society. He was graduated from University Medical College in Kansas City in 1902 and immediately began work with the Santa Fe Hospital Association, serving as assistant surgeon at the Topeka hospital. From 1913 to 1919 he was in charge of the railroad hospital at Fort Madison, and he returned to the Topeka institution in 1919 to serve as chief administrator. He was chief surgeon for the road from 1938 until his retirement in 1947. Dr. Bishoff was a fellow of the American College of Surgeons.

ROBERT LEE GRAHAM, M.D.

A doctor who had specialized in pathology at two Topeka institutions, Dr. R. L. Graham, 48, was found dead at his home in Topeka on March 22. He practiced first in Topeka at Topeka State Hospital, later serving as pathologist at Winter Veterans Administration Hospital. He was a graduate of Johns Hopkins University School of Medicine, class of 1937, and had been located at Beverly Hills before moving to Kansas.

EUGENE E. HAWK, M.D.

Dr. E. E. Hawk, 35, Wichita physician and member of the Sedgwick County Society, was killed in an airplane crash in Harper County on March 23. A graduate of the University of Kansas School of Medicine in 1953, Dr. Hawk served his internship at St. Francis Hospital in Wichita and then began practice there in association with Dr. A. F. Wittman. He was in military service during World War II.

Pulmonary Edema

A Study of Its Pathogenesis and Review of the Literature

DARRELL D. FANESTIL, *Kansas City*

The purpose of this paper is to review the recent literature on the pathogenesis of pulmonary edema. Each of several factors important in pulmonary edema will be discussed individually; then a correlation of these factors, such as is possible at this time, will be attempted.

The problem of pulmonary edema is unusually complex because of the large number of variables which can produce it experimentally and because of the variety of clinical conditions which apparently may cause it. Because of this complexity, there was disagreement among early students of the problem. Much of this is now being resolved because of the recognition of the distinction between the primary or immediate, and the secondary or remote or indirect causes.⁵³ For example, at one time emphasis was placed upon "neurogenic" factors with little regard to the mechanisms by which the nervous factors themselves might operate.

Pulmonary edema has been produced by a variety of procedures in the laboratory. Intra-tracheal injection of milk or milk substitute,⁴⁰ inspiratory or expiratory resistance,²² intra-cisternal injection of "fibrin" (thrombin and fibrinogen mixture),⁸ intravenous infusions under eupoxic and hypoxic conditions,¹⁵ adrenaline,^{28, 57} intra-peritoneal injection of thiosemicarbazide,⁵² ammonium salts,³⁶ craniad injection of fluids under high pressure into the common carotid arteries,³⁴ the production of hemorrhagic shock,¹⁸ alkalosis induced by intravenous sodium carbonate and sodium bicarbonate mixture,³⁰ bilateral cervical vagotomy,¹⁹ injection of irritating substances into either ventricle of the heart,¹² electrolytic lesions of the rostral hypothalamus of rats,²⁰ and inhalation of noxious gases,⁷ are all procedures that have been used successfully in the experimental production of pulmonary edema.

Luisada³² has listed the wide variety of clinical conditions in which pulmonary edema occurs:

A. Heart disease. This includes rheumatic or luetic involvement of the valves, arterial hypertension, mitral stenosis, coronary thrombosis, and diffuse

sclerosis of the myocardium. "Instances of these diseases comprise the greatest number of cases of acute pulmonary edema observed clinically in adults."³²

B. Diseases of the central nervous system. This includes trauma to the skull, diseases of the brain, and stellate ganglion manipulation.

C. Diseases of the lungs. Inhalation of toxic gases, pneumonia, pulmonary infarction, inspiratory obstruction, drowning, and rarely thoracentesis have been accompanied by pulmonary edema.

D. Others.

1. Allergy. "The possibility of angio-neurotic edema of the lungs cannot be ruled out."³²
2. Stimulation of hollow viscera, especially the stomach. This was noticed mainly by early observers, and the possibility that other diseases might have caused the edema must be considered.
3. Uremia.
4. Thyroid crisis.
5. Beri-beri.
6. Pregnancy.
7. Anesthesia with ether containing peroxide contaminants.⁵⁰
8. In conjunction with insulin shock therapy.¹³
9. Pressure on an enlarged liver in a failing heart case.³⁷
10. In salicylate therapy of rheumatic heart disease.⁵¹
11. Intravenous infusions of saline, especially in patients with cardiac, pulmonary, or renal disease.¹

History

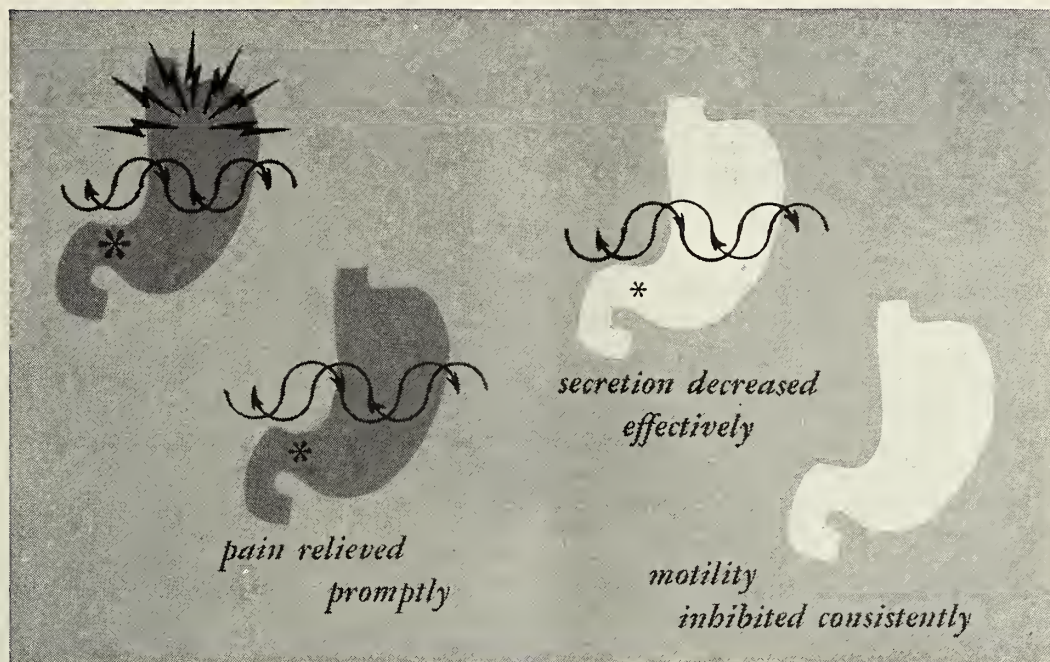
According to Luisada, pulmonary edema was probably first described by Maloët in 1752. A complete description of the clinical picture was given by Devay, Rilliez, and Barthez from 1850 to 1860. In these same ten years, Virchow and Cohnheim and Lichteim started research on lung edema.³² In 1878 Welch caused lung edema of the rabbit either by ligature of the aorta or by compression of the left ventricle. This work resulted in the "back-pressure" or "left-ventricular failure" theory: "A disproportion between the working power of the left ventricle and of the right ventricle of such character that the resistance being

This is one of a group of theses written by students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Mr. Fanestil is now a third year student at the school.

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incidence of side effects was minimal. . . ."

The therapeutic utility and effectiveness of Pro-Banthine in the treatment of peptic ulcer are repeatedly confirmed in the medical literature. Dosage: One tablet with each meal and two tablets at bedtime. G. D. Searle & Co., Chicago 80, Illinois, Research in the Service of Medicine.

*Lichstein, J.; Morehouse, M. G., and Osmon, K. L.: Pro-Banthine in the Treatment of Peptic Ulcer. A Clinical Evaluation with Gastric Secretory, Motility and Gastroscopic Studies. Report of 60 cases, Am. J. M. Sc. 232:156 (Aug.) 1956.

SEARLE

the same the left heart is unable to expel in a unit time the same quantity of blood as the right heart."⁵⁵ This results in pulmonary congestion and exudation of fluid from the capillaries.

As experimental and clinical evidence accumulated, this theory gradually became less accepted.³² In its place came the neurogenic theory which postulated that the edema was not mechanical but neurogenic in production. Steeves⁴⁸ has pointed out that while many clinicians adhere in thought to the mechanical theory, they apply the teachings of the neurogenic theory by using morphine as a therapeutic agent of choice.

Factors in the Production

In general, edema may arise from (A) reduced oncotic pressure of the plasma, (B) obstruction of the lymph channels, (C) an increase in capillary permeability, or (D) an increase in capillary blood pressure.⁶ In the specific case of pulmonary edema, these general factors as well as intra-alveolar pressure must be considered.

A. Reduced capillary oncotic pressure could cause pulmonary edema. Under normal conditions the oncotic pressure of plasma is greater than that of tissue fluid. This, then, is a factor favoring fluid movement into the blood stream. Near the arterial end of a capillary, fluid with a low protein concentration moves out of the capillary because the effective hydrostatic pressure (hydrostatic pressure of the blood minus the tissue fluid hydrostatic pressure) is greater than the effective oncotic pressure (oncotic pressure of the blood minus that of the tissue fluid). Near the venous end of the capillary this situation is reversed and fluid poor in protein (the protein goes into the lymph) comes back into the blood.⁶ Any factor which reduces the oncotic pressure of plasma will reduce the effective oncotic pressure and, therefore, more fluid will move into and less fluid will be taken up from tissue—in other words, edema may result.⁶

Since it is not the purpose of this paper to discuss factors which can decrease the oncotic pressure of plasma, they will be mentioned only briefly. Because the major portion of the oncotic pressure is due to albumin,¹⁰ hypoalbuminemia is the greatest factor in producing a low oncotic pressure. The major causes of hypoalbuminemia are:

1. Excessive loss of albumin, as in urine, edema fluid, or inflammatory exudates.
2. Inadequate protein supply due to dietary protein insufficiency, vomiting, or diarrhea.
3. Impaired synthesis, as in liver dysfunction, chronic infection, severe anemia, or cachexia.
4. Sudden plasma dilution, as with massive intravenous saline infusions.¹⁰

Moran⁴⁰ has shown that in the lungs another factor may be important in the reduction of effective oncotic pressure. This investigator showed that intratracheal injections of carbohydrate solutions (12½ grams per cent or stronger) would cause pulmonary edema in rabbits and guinea pigs. As he pointed out, the production of edema apparently results because the oncotic pressure in the alveoli due to the carbohydrate solution is sufficient to overcome that of the plasma in the capillaries. It can also be concluded from this work that any fluid in the alveoli with oncotic pressure may enhance edema formation—in deed, edema itself would enhance more edema.

B. Greater negative intra-alveolar pressure may be a factor in pulmonary edema production. Contrary to other tissues, an important factor opposing the high oncotic pressure and low hydrostatic pressure in the lung capillaries is the negative pressure in the thorax during inspiration.¹⁷ Taylor⁶ gives the changes in pressure within the lung: during ordinary quiet respiration, pressure on inspiration is about minus two millimeters of mercury and on expiration it is about plus three or four millimeters; however, maximal negative pressure developed by forced inspiration is from minus 40 to 50 millimeters, and maximum expiratory effort against a closed glottis is from plus 10 to 40 millimeters.

Drinker¹⁷ used a normal animal not subjected to circulatory strain (such as exercise or cardiac incompetency) but subjected to a slight degree of anoxia and resistance to inspiration in an attempt to determine if greater negative inspiratory pressure alone could cause pulmonary edema. He found that the animal could avoid serious pulmonary edema for a long time, but that there were alterations in the lung suggestive of pulmonary edema. Certainly, in the dyspneic individual, the greater negative pressure is a factor to be considered.

C. Decreased lymph drainage or poor ability to handle increased lymph formation may enhance edema formation. "Obstruction to the outflow of lymph from the tissue spaces may cause pronounced edema. . . ."⁶

Drinker says that lymph capillaries in the lung do not surround the alveoli, but end just short of the atria. Thus, alveolar septa must become engorged with fluid before lymph can flow. Because of this, excess fluid filtered out of capillaries can enter the alveolar air spaces about as easily as it can spread inside alveolar tissue to the lymph capillaries. Drinker believes that normally some fluid does enter the alveoli. This fluid is either coughed up, absorbed directly into the lymphatics, or the protein hydrolyzed and then absorbed into the lymphatics. While blockage of lymphatics may cause edema, even a decrease in the

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In summary Ferguson concluded: "*The most notable im-
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days (or sooner, depending upon response), dosage may be re-
duced. A maintenance dose of 0.25 mg. daily is often sufficient.

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a history of depressive episodes should be watched carefully.

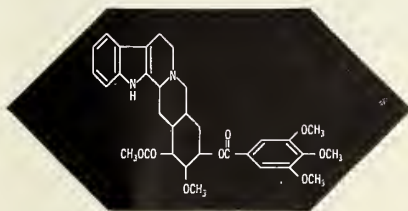
Additional literature is available upon request.

Preparation: Harmonyl is supplied in
0.125, 0.25-mg. and 1-mg. tablets.

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Reference: 1: Ferguson, J. T.: Comparison of Reserpine and Harmonyl in Psychiatric Patients:
Preliminary Report, *Journal Lancet*, 76:389, December, 1956.

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amount of lymph flow from the lungs without a decrease in lymph formation may cause more than normal amounts of fluid to be found in the alveoli.

Beattie⁵ has pointed out a factor in decreasing lymph flow. Since lymphatic vessels from the lung empty directly into systemic veins, an elevated venous pressure will have an adverse effect on the reabsorption of fluid into lymphatics and, consequently, more alveolar fluid would form. This fluid, then, in addition to being the start of edema, could enhance further edema production by decreasing the effective oncotic pressure and by increasing blood capillary permeability due to anoxia.

In addition to simple obstruction of lymph flow, pulmonary edema may be enhanced by increased lymph formation. Drinker¹⁷ has shown that the lymph drainage from the lungs of the dog (except for a small area near the left apex) is to the systemic circulation via the right lymphatic duct. He believes that practically the same situation exists in humans. This, according to Drinker, is important, for the right lymphatic duct is short, has a sharp curve, and is not too large—in short, it is a "bottleneck." Therefore, an increased lymph flow from the lungs may not be able to enter the systemic circulation as fast as it is produced. This results in the same thing as lymphatic obstruction—an increased tendency for pulmonary edema formation.

However, there is not agreement upon the importance of lymph flow in the genesis of lung edema. Visscher,⁵³ for example, believes that the increased lymph flow found in association with pulmonary edema is a consequence rather than a cause of the edema.

D. An increase in lung blood capillary permeability would cause pulmonary edema. Anoxia, neurogenic factors, and toxins have been suggested as being responsible for such an increase in permeability.

Drinker has shown that the amount of lymph flowing from the right lymphatic duct of dogs increases when the animal is hypoxic. This he supposed was an important factor in the production of pulmonary edema and further, that the cause of an increased lymph flow was an increase in the permeability of the lung blood capillaries. In general, hypoxia probably causes an increase in capillary permeability. However, Drinker claims that capillaries in some parts of the body are rendered more permeable than others by the same hypoxic state and that the lung capillaries are "significantly assailable" by hypoxia. Further, he believes that the lung capillaries in the alveoli also vary from other capillaries in that they are dependent upon the alveolar air for their oxygen supply rather than upon arterial blood. Because of these two special features of pulmonary capillaries and other evidence

in his experience, Drinker said, "It is my belief—I cannot say conviction—that . . . (pulmonary edema) . . . depends more upon alterations in the permeability of the lung capillaries than upon complicated pressure relations in the pulmonary circulation."¹⁷

Many factors may cause alveolar anoxia: (a) a portion of alveoli are normally collapsed, (b) small mucous plugs may prevent oxygenation, (c) distended pulmonary capillaries can reduce the volume of alveolar air spaces, and (d) excess filtrate or aspirated fluid can occupy alveolar spaces.⁴¹

Pullen,⁴¹ however, has pointed out that anoxia does not necessarily produce edema. Wiggers concurs: ". . . very low oxygen tensions have been tested innumerable times both on animals and man and do not seem to produce pulmonary edema."⁵⁶

Nevertheless, it is important to mention that Drinker believes that "anoxia begets anoxia" and, consequently, edema. As soon as alveolar capillaries begin to leak excessive fluid, from whatever cause, the barrier between their walls and alveolar air becomes thicker; therefore, the capillary is even more hypoxic. This causes further transudation of fluid—and on around the cycle. "The presence of free alveolar fluid and foam (which is characteristic of pulmonary edema) increases the diffusion distances for gas exchange and also greatly impedes alveolar ventilation. Both of these effects are serious, but the latter is calamitous and is responsible for the rapidly fatal characteristic of acute lung edema."⁵³

We may conclude, therefore, that anoxia probably does increase capillary permeability. Whether anoxia by itself can cause pulmonary edema is disputed, but experimentally it does not.^{15, 56} However, it may enhance further edema formation once the process has already started.

A neurogenic cause for an increase in pulmonary capillary permeability has also been postulated. Cameron and De⁸ state that respiratory excursion, carotid blood pressure, and right atrial pressure undergo similar changes after severe tracheal obstruction, pulmonary embolism with starch granules, and intracisternal injection of "fibrin" with or without vagotomy, but that only the fibrin without vagotomy is followed by pulmonary edema. They then suggest that neither asphyxia nor mechanical disturbances in pulmonary circulation plays an important part in the genesis of lung edema, but that the permeability of lung capillaries may be modified by the outflow of stimuli from the brain via the vagi so that transudation of fluid from the pulmonary vessels is sufficient to produce edema.

Another group of agents, toxic substances, has been suggested as being important in increasing permeability. Examples of "toxic substances" are lethal gases⁵⁶

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and toxic agents carried by the blood, such as bacterial split-products or histamine-like substances from tissue destruction.¹⁶

Thus, in 1949, Wiggers concluded that "... increase in permeability of pulmonary capillaries seems to be the primary factor in the production of pulmonary edema, but the processes by which such damage comes about are obscure. Anoxia, chemical toxins, and neurogenic factors have been suggested but not established."⁵⁶

E. An increase in the pulmonary capillary hydrostatic pressure may be a factor in the genesis of pulmonary edema. Several mechanisms have been suggested to account for such an increase in pressure: (a) pulmonary vein or venule constriction, (b) increased pulmonary blood volume, (c) left ventricular failure, (d) pulmonary arteriolar dilatation, and (e) the effect of the bronchiolar musculature on the pulmonary circulation.

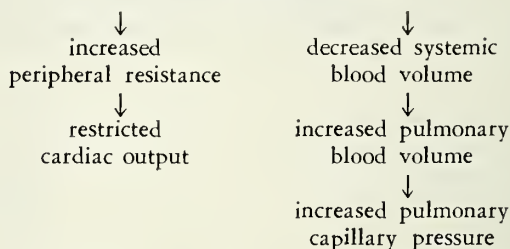
a. Pulmonary vein or venule constriction could conceivably cause an increase in capillary pressure. However, it is doubtful if much constriction ever occurs in the pulmonary veins.

b. Increased pulmonary blood volume as a cause of increased capillary pressure.

Courtice and Korner¹⁵ did experiments in 1952 designed to establish the validity of the experimental observation of and the conclusions drawn from those observations by Drinker, referred to previously. They showed that prolonged and massive intravenous infusions are necessary to produce pulmonary edema in the eupoxic animal, but that hypoxia significantly decreases the amount and length of infusion necessary. Their results showed that hypoxia causes an increase in peripheral resistance and an increase in systemic venous pressure. They then suggested that the factors causing the increased peripheral resistance also cause the redistribution of the blood so as to decrease the peripheral blood volume, increase the volume of the venous blood (and, therefore, the rise in venous pressure), and increase the volume of blood in the expansile pulmonary vascular bed. Thus, although hypoxia will not produce pulmonary edema by itself, it will cause a redistribution of blood so that a small infusion may distend the pulmonary capillary bed enough to cause the capillary pressure to rise over the oncotic pressure. From their extensive experiments they concluded that hypoxia does not cause a selective increase in permeability of lung capillaries, that their (as well as Drinker's) experimental results can be explained on the basis that pulmonary edema is produced when the pulmonary capillary pressure rises enough to overcome the oncotic pressure of the blood, and that such a pressure relation develops more quickly in hypoxia.

These investigators were influenced in their conclusion by the work of the Sarnoffs, who studied hemodynamics associated with intra-cisternal injection of "fibrin." Using this technique, they were able to produce pulmonary edema, as had Cameron and De. The Sarnoffs, however: (a) were unable to prevent the development of the edema by vagotomy,⁴⁶ (b) noted that the action of intra-cisternal fibrin was not due to an increase in pressure of the cerebrospinal fluid, but probably was due to a non-specific irritation of medullary centers, such as the cardio-vascular center,⁴⁶ (c) noted that the injection is followed by (1) a mean increase of 95 per cent in the peripheral vascular resistance,⁴⁷ (2) systemic hypertension and decreased cardiac output,⁴⁷ (3) an approximate doubling in the volume of blood in the pulmonary circulation,⁴⁷ (4) a gross increase in the size of the left auricle and engorgement of the pulmonary veins,⁴⁶ and (5) an increase in pulmonary vascular (artery, vein, and left atrial) pressure with no increase in resistance (and, therefore, an inference of no change in pulmonary vasotension).⁴⁹ They held that the increase in peripheral resistance was due to peripheral vasoconstriction. They outline the

effects of this systemic vasoconstriction:⁴⁵



The systemic vasoconstriction, they believe, is mediated by nervous control, for ganglion blocking agents prevent the vasoconstriction and the edema.⁴⁴

Because of their findings, the Sarnoffs entered a new term in the literature, *neurohemodynamic pulmonary edema*, which they define as "... that state wherein an increase in the rate of the transfer of fluid from pulmonary capillary to the extra-vascular space of the lung is brought about by an increase in pulmonary capillary pressure, which in turn is brought about either directly or indirectly by nerve impulses."⁴⁴

Tennekoon produced pulmonary edema in rats by intraperitoneal injection of thiosemicarbazide. Because this procedure causes an increase in systemic blood pressure followed by lung edema (both were preventable by sympatholytic drugs) and because thiosemicarbazide fails to produce edema in a heart lung preparation, he believes that this edema is a result of systemic vasoconstriction causing a "short-circuiting"



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of the blood to the pulmonary circulation and that this is mediated through the sympathetic system.⁵²

It has been known since 1904³⁹ that adrenaline could cause pulmonary edema. At first this was explained by Welch's hypothesis.⁴ In 1932, however, Hochrein and Keller demonstrated that epinephrine injection was followed by an apparent increase in pulmonary blood volume during the systemic hypertension. Hamilton et al.²³ in 1938 attributed the edema to back pressure from the left ventricle. However, they did describe an "intense systemic vasoconstriction" following the epinephrine injection. In the same year, Barach et al. said, "Our evidence suggests, to our mind, that the high capillary blood pressure is the significant factor in the pathogenesis of pulmonary edema due to adrenalin."⁴ Stone and Lowe⁴⁰ agree with the last two sources mentioned—that high pulmonary circulatory pressure can account for edema production—but offer no mechanism for the production of this pressure increase, except by noting that it and the edema are prevented by adrenergic blocking drugs.

In 1953 Korner³¹ produced pulmonary edema by infusion of nor-adrenaline. He found a rise in systemic venous pressure and an increase in pulmonary blood volume and attributed these findings to a vasomotor redistribution of blood.

A clinical condition in which an increase in pulmonary capillary pressure occurs is mitral stenosis where the outflow of blood from the lungs is impeded. Sympathetic stimulation, caused by excitement, exertion, cold, anger, or fright is followed by (a) tachycardia, which shortens diastole and impairs emptying of the left atrium, and (b) vasoconstriction and resultant redistribution of blood toward the lungs.³⁵ Both of these increase the pulmonary vascular pressure.

c. The left ventricular failure hypothesis is not widely accepted by investigators in the subject at this time. It may have a role in the development of some pulmonary edemas, as mentioned above in connection with mitral stenosis. However, it generally does not agree with the experimental findings. For example, the Sarnoffs (a) were able to produce an elevation of the left atrial pressure even while systemic blood flow increased, and (b) showed that dilatation of the systemic vascular bed prevented edema formation even though systemic resistance was maintained at a high level by aortic compression.⁴⁵

d. Pulmonary arteriolar dilatation. There has been much debate and disagreement on the role of vasomotor fibers to the pulmonary circulation. Wiggers, in 1949, concluded that "a critical review of all the experimental evidence leaves no doubt as to the existence of vasomotor nerves to the pulmonary vessels

in mammals and further strongly indicates that vasoconstrictor impulses travel chiefly over the sympathetic system."⁵⁶ However, this same author continues, "Most physiologists agree that the vasomotor apparatus is not important in controlling blood flow or pulmonary vascular resistance."⁵⁶ Nevertheless, Aviado et al.³ demonstrated a dilatation of pulmonary arterioles by hypoxia. Luisada³⁵ evidently interpreted this as being due to stimulation of the carotid bodies by the hypoxia and a reflex dilatation of the arterioles. It is true that Luisada and Sarnoff³³ in 1946 reported prevention of pulmonary edema by interruption of the reflex path from the carotid sinuses. However, this is hard to reconcile with the report of Wassermann and Goodman⁵⁴ in the same year that prevention of pulmonary edema had been accomplished by digital pressure in the carotid body area. If arteriolar dilatation does occur, this would increase the pressure in the pulmonary capillaries.

e. Rodbard⁴² postulated another factor that influences the pulmonary circulation, the bronchiolar musculature. During inspiration the bronchioles dilate actively and intra-alveolar pressure falls. An index of this is seen in the pulmonary diastolic pressure. Adrenergic influences also dilate the bronchioles, reducing the intra-alveolar and pulmonary diastolic pressures. "If this effect is marked and prolonged, pulmonary congestion and edema may ensue as a result of the inhibition of the protective bronchiolar muscular tone."⁴²

The discussion of one final experimental method of producing pulmonary edema will be helpful. The ammonium ion causes pulmonary edema. This procedure resembles epinephrine-produced edema in many respects.³⁶ The Koenigs say that one apparent point of difference is that central nervous system depressants (such as morphine or ether) inhibit epinephrine-produced edema, but not ammonium-produced edema. This finding, however, is not substantiated by MacKay, Jordan, and MacKay³⁶ or by Cameron and Sheikh.⁹ There is also disagreement about the mechanism involved.

Cameron and Sheikh obtained no evidence of serious hemodynamic disturbances and "conclude that lesser degrees of pulmonary edema develop in the rabbit after the intravenous injection of ammonium chloride without hemodynamic disturbance."⁹ They suggest that capillary permeability for protein is increased by the ammonium ion for they say the edema fluid has a high protein content from the beginning. Tennekoon⁵² found that ammonium chloride produces pulmonary edema in the heart-lung preparation and agrees with Cameron and Sheikh that there may be a direct action on the lung capillaries by the ammonium ion. Sarnoff and Kaufman,⁴³ however, found

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that ammonium chloride intra-peritoneally injected in cats caused left auricular and vena caval pressure to rise significantly and that systemic arterial pressure was normal or lowered. They feel that their work does not preclude the possibility of other mechanisms operating, but that it does suggest that failure of the left ventricle may play a role in the development of the edema.

Jaques introduced another aspect of the problem. He reports that when pulmonary edema is induced by ammonium ion in rats, a depletion of pulmonary histamine occurs.²⁷ The released histamine does not enter the edema fluid in appreciable amounts but seems to be carried in the blood. The same investigator found that the histamine content of rat lungs increases with the age of the rat and, further, that the incidence of pulmonary edema produced by ammonium ion is strongly correlated with lung histamine levels.²⁸ He believes that the ammonium ion causes the adrenals to produce adrenaline, which in turn releases the histamine from the lungs, and edema follows. I can only suggest that this histamine might cause the increase in pulmonary capillary permeability reported by Cameron and Sheikh and Tennekoon.

Discussion

From the foregoing, it should be apparent: (1) that there are several factors which may be important in the genesis of pulmonary edema, (2) that opinions vary about the importance of these various factors, and (3) that opinions vary about the mechanisms that produce these various factors.

"Among the dozens of methods employed for inducing pulmonary edema experimentally, there is none which has been proved to act by any other primary mechanism than an elevation of lung capillary pressure relative to tissue pressure."⁵³ Visscher, in making this statement, is, I believe, probably correct. It should be pointed out, however, that the above statement does not mean that all the methods employed for inducing pulmonary edema have been proved to act primarily by elevation of lung capillary pressure. For example, ammonium ion pulmonary edema has not been shown to be definitely and primarily due to an elevation of the pulmonary capillary pressure. Further, this statement does not mean that an increase in lung capillary pressure will cause edema. Luisada tells that Altschule put a balloon in the left atrium of a dog, sewed up the chest wall, and inflated the balloon. This failed to cause pulmonary edema even though the inflation lasted, in some cases, several hours and must have increased pulmonary vascular pressures.³²

Once pulmonary edema is started, by whatever primary mechanism (which probably is pressure re-

lationships in most cases), other factors become exceedingly important. As Visscher, himself, mentioned: "to say the capillary pressure rise is a uniform finding . . . does not imply that increased filtration pressure is the only determining factor."⁵³ Once transudation of fluid into alveolar spaces occurs, the diffusion distances for gas exchange increase and the alveolar ventilation is impaired. Both of these changes lead to anoxia of the alveoli, which Drinker considers to be of utmost importance. Again, once transudation occurs, the effective osmotic pressure in the capillary is reduced. This, of course, favors edema development.

As has been mentioned by Visscher⁵³ and Cassen and Kistler,¹¹ it may be that capillary pressure and capillary permeability are not separable but are associated with one another. Visscher mentions the "pores" permeable to protein molecules found in other capillaries and states that it may be that vascular distention under increased pressure has an effect on "pore area" permeable to protein and, consequently, distention itself may render a capillary more permeable. Cassen and Kistler said, "The intracellular cement substance of capillary walls is postulated to consist of processes having elastic properties that tie the walls together."¹¹ Further, there is a critical value above which the capillary pressure must go before the elastic processes are ruptured and fluid leakage occurs. Capillary pressure may make a capillary more permeable.

Or it may be that increased transudation of fluid can occur in the lungs without the occurrence of any of the above discussed factors, except an increase in lung blood volume. Cournand has demonstrated that a considerable increase in pulmonary blood flow can occur in normal humans without a change in pulmonary arterial pressure.¹⁴ Luisada says, "Hochrein and associates have shown that enormous changes in the volume of capillary bed (in the lung) may occur as a result of altered dynamics, with little or no change in pressure. This is probably due to the negligible resistance to dilatation of pulmonary capillaries due to the absence of significant tissue pressure such as is found elsewhere in the body."³² The result of an increase in blood volume without pressure changes is an increase in filtering area.⁶ This will result in a greater quantity of fluid filtered out of the capillaries.⁶ Altschule has suggested this as a factor causing increased transudation of lymph fluid in the lung.²

Finally, it should be mentioned that, although one variable such as trauma to the central nervous system or poisoning with ammonium salts may be sufficient to cause pulmonary edema,³⁵ several investigators have shown that once a tendency toward lung edema exists it may be produced more easily by another factor.^{15, 32}

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For example, the Sarnoffs reported that intravenous infusion of 10 cc. of saline per kilogram of dog weight has no effect on the pulmonary venous pressure. But the same infusion, in the presence of marked peripheral vasoconstriction, "produces striking elevations of pulmonary venous pressures."⁴⁴ In many cases of pulmonary edema it is possible that a number of factors have been important.

Summary

The complexity of the problem of the pathogenesis of pulmonary edema is evident when the variety of clinical and experimental conditions that apparently cause it are considered.

A decrease in the effective pulmonary capillary oncotic pressure is a factor in the genesis of some cases of pulmonary edema. In most cases this is due to a hypoalbuminemia, but aspiration of fluid with osmotic tension into the lungs may be a cause in other instances.

An "increase" in the negative intra-alveolar pressure occurs on forced inspiration. This may be a factor in fluid transudation in some cases.

An obstruction of lymph flow from the lungs could cause lung edema. The importance of the increase in lymph flow from the lungs that occurs in pulmonary edema is not definitely established.

An increase in the permeability of the pulmonary capillary endothelium will, of course, aid greatly in the production of pulmonary edema. A number of factors have been suggested by various investigators as the cause of an increase in permeability. Some people believe that this is the primary factor in pulmonary edema production.

The current trend of investigators, however, is to incriminate an increase in pulmonary capillary pressure as the primary factor in the genesis of lung edema. Various mechanisms by which such an increase in pressure occurs have been suggested.

It may be fallacious, however, to separate increase in membrane permeability from increase in capillary pressure. An increase in pressure, resulting in distention of the capillary, may make the endothelium more permeable.

The amount of transudated fluid may be increased without any of the above suggested factors occurring. An increase in pulmonary blood volume without an increase in pulmonary vascular pressures can occur. This could cause transudate formation.

Even if one factor is eventually established as primary, this does not mean that it is the only determining factor. Pulmonary edema can be caused by any combination of the above factors. Indeed, once there is a tendency toward edema formation, another factor may more easily cause it.

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BOOK REVIEWS

Clinical Examinations in Neurology. By Members of Sections of Neurology and of Physiology, Mayo Clinic and Mayo Foundation. Published by W. B. Saunders Company, Philadelphia. 370 pages, 76 figures. Price \$7.50.

There are many unusual and helpful features about this extremely well illustrated book on the examination of the nervous system. It was designed originally to fulfill the needs of instruction of those training in neurology at the Mayo Clinic, and therefore includes instructions and samples of forms for testing and reporting such phenomena as aphasia, sensory losses, reflex findings, etc.

Electroencephalography and electromyography, speech disturbances, and neuro-ophthalmology receive special treatment in a concise and readable form. The section treating the mental status examination is at times over-simplified and often ambiguous. Thus, for instance, the mood and insight appear to be tested by question and answer technique.

The publication of this manual represents a real contribution to those interested in the examination of the nervous system, both in the training for and the practice of medicine.—J.A.S.

Pediatric Cardiology. By Alexander S. Nadas, M.D. Published by W. B. Saunders Company, Philadelphia. 587 pages, 343 figures. Price \$12.

These 587 pages devoted entirely to the subject of the heart and its problems in infants and children illustrate the tremendous increase in the scope of pediatric cardiology in the past few years. As recently as 15 or 20 years ago the standard pediatric texts were allotting about 40 pages to the whole subject. The tremendous increase in knowledge and interest has been in the field of congenital heart disease, and it is this portion that receives the most attention in Dr. Nadas' book.

He divides his book into four sections: diagnostic

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That knowledge will be gained — and, indeed, the riddle of cancer itself, will one day be solved in the research laboratories. To continue to support this vital work, as well as to carry on its dynamic education and service programs, the American Cancer Society is seeking \$30,000,000. We are again appealing to the public to “fight cancer with a checkup and a check.”

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tools, acquired heart disease, congenital heart disease, and a short section on anesthesia for children with heart disease. The book covers all of these sections completely and in a readable and informative manner. However, it is the diagnostic tools relating to congenital heart disease, such as radiology, electrocardiography, phonocardiography, cardiac catheterization, and angiocardiography that receive most of the space and attention in that section; and the section on congenital heart disease is approximately half the book.

It is obviously his intention to present a guide to the pediatrician and general physician interested in diagnosing congenital lesions in his own patients. In the foreword, the book is referred to as "a do-it-yourself cardiology." It succeeds admirably in that purpose.—L.S.

Proceedings of the Third National Cancer Conference Sponsored by American Cancer Society and National Cancer Institute, Detroit, June 4-6, 1956. Published by J. B. Lippincott Company, Philadelphia. 961 pages. Price \$9.00.

This book is unique in several respects. First, because it comprises the verbatim comments and opinions of 200 participating essayists whose names might well fill a "Who's Who" in cancer. Secondly, because practically every major division of the cancer problem is discussed in such a manner that the average interested physician can glean practical worthwhile facts by perusal of any or all of these divisions. Finally, it represents a tremendous bargain in that its 961 pages are replete with readable graphs, tables, and beautifully prepared photographs and photomicrographs.

Contrary to what one might expect from such a conference, this book has achieved a satisfactory balance between a presentation of the theoretical aspects of cancer investigation and the more practical aspects of neoplastic diagnosis and therapy. Actually no more than one-third of the reported proceedings pertain to the purely academic and research phases of the cancer problem, which lends further support to its value as a practical cancer reference source.

In addition to rather detailed discussions on 120 different subjects pertaining to human cancer, there is included a symposium on the end results achieved by treatment. This section deals with results of current cancer therapy employed in the principal types of malignancies involving all of the human organ systems. Also, for the statistically minded physician, there are sections pertaining to survival rates for various types and stages of malignancies ranging from the hemopoietic system to the intestinal tract.

The simplicity of language and yet completeness of discussions pertaining to a vast number of topics without undue verbosity should make this book a worthwhile addition to the library of any practicing physician desiring to keep abreast of current cancer trends.—D.C.R.

Physiologic Principles of Surgery. By Leo M. Zimmerman, M.D., and Rachmiel Levine, M.D. Published by W. B. Saunders Company, Philadelphia. 988 pages, illustrated. Price \$15.

This book brings to the surgeon something that has long been needed. It is an attempt to correlate various physiologic principles with physiologic problems that present themselves to the surgeon. Dr. Zimmerman, a surgeon, and Dr. Devine, a physiologist, have edited a text that brings together in a lucid discussion the basic principles of physiology as they apply to surgery of the various organs of the body.

For the surgeon, it is an excellent review of physiology, brought up to date. It gives him a correct and concise discussion with the surgical application interlaced. Heretofore, one was required to return to the old physiology textbooks for the physiology of the organs of interest. It should be an excellent book for the doctor preparing for board examination in surgery. Although possibly too specific in its application, it seems to me this book has application for the medical student also.

Leading doctors in their fields have written chapters in the book on their particular fields of interest. The editors have attempted to edit all chapters so that wherever possible there will be no overlapping or repetition of knowledge.

This book is highly recommended to the busy surgeon who wants a quick review of the physiology of the organs of the body with their surgical application.—S.L.V.

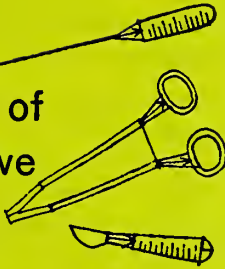
ANNOUNCEMENTS

Annual assembly in otolaryngology, University of Illinois College of Medicine, Sept. 30-Oct. 6. Write Department of Otolaryngology, 1853 West Polk Street, Chicago 12, Illinois.

Ninth postgraduate assembly in endocrinology and metabolism, sponsored by Endocrine Society, Medical College of Georgia, Augusta, Oct. 21-25. Registration limited to 100. Tuition fee \$100.

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In preparation for the observance of The Kansas Medical Society's centennial anniversary, members of the Committee on History are attempting to collect all material of historical interest. Physicians who can contribute information, records, etc., are urged to send such to

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Approved residencies in physical medicine and rehabilitation available at New York University-Bellevue Medical Center, beginning July 1, starting at \$3,400 with dependency allotment added. Apply to Joseph G. Benton, M.D., Institute of Physical Medicine and Rehabilitation, 400 East 34th Street, New York 16, New York.

Sixth annual symposium for general practitioners on tuberculosis and other chronic pulmonary diseases, Saranac Lake, New York, July 8-12, approved for 26 hours of formal credit for AAGP members. Registration fee \$40. Information available from Dr. Henry W. Leetch, Symposium for General Practitioners, P. O. Box 11, Saranac Lake.

Eight-week course in occupational medicine, Sept. 16-Nov. 8, offered by New York University Post-Graduate Medical School. Write the Dean, 550 First Avenue, New York 16, New York.

Sept. 1 is deadline for applications for certification by American Board of Obstetrics and Gynecology. Information available from Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6, Ohio.

Postgraduate symposium on basic sciences related to anesthesiology, offered by University of Pittsburgh School of Medicine, June 10-14, Pittsburgh, Pennsylvania. Registration fee \$25. Registration limited to 50. Write 3941 O'Hara Street, Pittsburgh.

Free cardiac surgery program offered by National Jewish Hospital, 3800 East Colfax Avenue, Denver 6, Colorado, to those unable to pay for private care. Applications considered on behalf of patients suffering from cardiovascular defects amenable to surgical intervention. Periodic reports made routinely to referring physician.

Four courses in ophthalmology for specialists offered by New York University Post-Graduate Medical School during first half of 1957-1958 academic year: histopathology, Sept. 16-20; surgery of eye, Oct. 28-Nov. 2; ophthalmoscopy, Nov. 4-8; surgery of cornea, Dec. 2-6. Write Office of Associate Dean, 550 First Avenue, New York 16, New York.

ABSTRACTS FROM CURRENT LITERATURE

Atrial Fibrillation

Class, Robert N.: Transient atrial fibrillation, a frequent occurrence in apparently normal hearts, U. S. Armed Forces Med. Jnl. 8:1-13 (Jan.) 1957.

Any sizable number of persons with atrial fibrillation can be divided into a large group with diseased hearts and a small group with anatomically normal hearts.

Over 40 years ago Gassage and Broxton Hicks reported a young man with atrial fibrillation and otherwise normal cardiac findings. Nearly two decades later, Parkinson and Campbell reported 15 per cent of 200 patients with paroxysmal atrial fibrillation showed no signs of cardiac disease. Accumulated data since then indicates 5 to 6 per cent of all atrial fibrillation occurs in normal hearts and the arrhythmia is transient in about two-thirds and established in the remainder.

The author, Major Class, reports 16 cases of transient atrial fibrillation observed in a 30-month period in overseas military personnel. Each case was studied by x-ray, and all indicated laboratory studies after electrocardiogram tracings confirmed the diagnosis. Pertinent data of each case are presented, and details of four of the cases are discussed. Only one patient was over age 35 when attacks began and in five cases the onset was at an age of 21 or younger. Symptoms included sudden recurrent oppressive and aching precordial pain associated with palpitation and followed by dyspnea. In a 21-year-old airman, attacks had begun at age six, were precipitated by physical exertion or emotional tension, occurred at intervals of a few days to six months and usually lasted only a few minutes, though one had lasted 30 hours.

Hysterectomy in Young Women

Jacobs, Warren M., and Daily, Harold I.: Hysterectomy in young women, Surg., Gynec. and Obst. 102:5 (May) 1956.

This article reviews 68 cases of hysterectomies done on women 30 years of age and younger from a clinical and pathological standpoint.

Tables are included giving the type of procedure performed, indications for surgery, and pathology.

In recurrent resistant pelvic inflammatory disease, the authors feel treatment should be either medical,

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or, if surgery is done, total hysterectomy and bilateral adnexectomy. In a rare instance, the disease may be involving only one adnexa; then unilateral adnexectomy is indicated.

Symptomatic myomas can be treated by myomectomy if technically feasible and if both tubes are patent and other causes of infertility in either husband or wife do not exist.

Patients not desiring more children, who had a prolapse with cystocele or rectocele, were preferably treated by vaginal hysterectomy and repair. Vaginal hysterectomy was used for carcinoma in situ of cervix also.

The authors believe that when a pelvic laparotomy is being done and it is determined that future pregnancies are impossible because of previous removal or bilateral occlusion of the tubes, the uterus should be removed, provided the patient is in good condition and has been informed of such possibility beforehand.

The procedures discussed are offered as a possible improvement over the often-incomplete surgery which has been done in the past and has yielded discouraging results. Further long-term follow-up of these procedures will be necessary for more complete evaluation.—*R.P.S.*

Breast Cancer

Ackerman, Lauren V.: An evaluation of the treatment of cancer of the breast at the University of Edinburgh (Scotland) under the direction of Dr. Robert McWhirter, Cancer 8:5, 883-887 (Sept.-Oct.) 1955.

This article reports the findings and conclusions reached by Dr. Ackerman after a personal examina-

tion of the records and pathological tissues of 719 patients with cancer of the breast, which had been previously reported by Dr. Robert McWhirter of the University of Edinburgh. Dr. McWhirter's method of treatment, in all stages of the disease, was simple mastectomy followed by irradiation therapy, which he prefers to radical mastectomy, with or without x-ray.

Dr. Ackerman notes variables which affect the evaluation of such clinical material. These pertain to the judgment and technics of pathologist, surgeon, and radiologist.

Dr. McWhirter feels that x-ray treatment sterilizes cancer at the operative site and in axillary nodes. Dr. Ackerman finds, in numerous pathological sections, that the cancer appears unaffected by previous x-ray therapy.

Furthermore, hormone therapy and x-ray-castration had been used in a large number of instances with an incalculable effect on the course of the disease. There were almost no autopsies, and hence the report of patients "dying of intercurrent disease" is unreliable.

Finally, a persistence of cancer at the primary site in 16 per cent of stage I and II cases was noted; these are the stages which have a high cure rate by radical mastectomy.

Morbidity from x-rays was high in 47 patients, with 3 amputations of the arm.

Dr. Ackerman concludes that Dr. McWhirter's method of treatment can be established only after a much more rigid control of case material. Radical mastectomy, by the trained surgeon, operating on properly selected cases, offers the greatest hope for permanent cure.—*T.P.B.*

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Agranulocytosis

Report of Case following Use of Chlorpromazine

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A 62-year-old white female psychiatric patient was given chlorpromazine in gradually increasing dosage from July 12 to August 21, 1956, the total amount given being 8.9 grams. On the latter date, her complaint of a sore throat sufficiently severe to interfere with swallowing resulted in a medical consultation and a leukocyte count. Her total leukocyte count was 485 per cu. mm., of which only 3 per cent were granulocytes.

Her history indicated a sore throat of ten days' duration, becoming increasingly severe and associated with dryness of the nose and throat, congested turbinates, and difficulty in breathing and swallowing, but no cough or dyspnea.

When examined, she did not appear seriously ill, but moved her jaws with discomfort. There were tender lymph nodes beneath both sides of the mandible. The pharynx appeared swollen, reddened, and dry, but not purulent, and it was not ulcerated. The nasal mucosa bore a similar appearance and was congested, filling the nares bilaterally. The conjunctivae were pale, the chest and abdomen not remarkable.

Culture of a throat swab grew alpha hemolytic streptococci and nonhemolytic staphylococci, both in abundance. Culture of the blood yielded no growth. A smear of the sternal marrow revealed moderate hypoplasia, with apparently adequate erythroblasts, and megakaryocytes in abundance; myeloblasts, promyelocytes, and myelocytes were present, but no granulocytes of greater maturity; many plasma cells were present. In the peripheral blood a normal thrombocyte count was obtained, and a moderate drop in hemoglobin and in erythrocytes was noted, as com-

pared with a count recorded one month earlier.

No previous temperature record was available. For the first three days a remittent fever obtained, reaching no higher than 100.5 degrees Fahrenheit. Therapy consisted of parenteral procaine penicillin 600,000 units and streptomycin 0.5 Gm. (alternating with dihydrostreptomycin) every 12 hours. Symptomatic therapy included anesthetic lozenges and decongestive nasal medication, analgesics, and sedation. A single pint of blood was transfused.

On the second day the patient's total leukocyte count dropped to 177 per cu. mm., and two days later all granulocytes disappeared from the peripheral blood.

After the initial three febrile days, there followed five afebrile days, during which the patient improved symptomatically, swallowing easily. The pharyngeal edema subsided though redness persisted. The cervical lymph nodes became smaller and less tender. But a new and tender lymph node appeared in the right groin on the fourth day, followed by a suggestively spreading cellulitis of that region. An occasional blast cell was found in the peripheral blood during the sixth to ninth days of observation.

On the eighth day, soreness and redness of the mouth and gums appeared. Fever of 100 degrees Fahrenheit was present throughout the ninth day. Culture of a throat swab again grew alpha hemolytic streptococci and hemolytic staphylococci, both in great numbers. By this time the total leukocyte count had risen to 600 per cu. mm., all mononuclear cells.

On the ninth day oral novobiocin was added to the therapy, 0.25 Gm. every 6 hours. Two days later fear of monilial infection of the mouth, not later substantiated by culture, led to the addition of Mycostatin to the other therapies.

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The patient was again afebrile during the 10th and 11th days, but the following two days were again characterized by remittent fever to 100.8 degrees Fahrenheit and recurrence of soreness of the mouth and throat, interfering with food intake. On the 12th day of observation, therefore, sulfamerazine was added (4.0 Gm. initially, followed by 1.0 Gm. every 6 hours), and 20 cc. of the patient's blood was injected intramuscularly.

The patient proved afebrile thereafter and improved steadily symptomatically. The leukocyte count reached 1000 per cu. mm. on the 13th day, all cells being mononuclear. A few immature granulocytes appeared the next day. The granulocyte count rose rapidly and progressively thereafter, consisting at first of predominantly immature forms. Normal total counts were reached by the 19th day, but immature forms persisted until the 29th day. Sternal marrow aspiration on the 22d day yielded numerous thick flakes of marrow, which on microscopic examination showed marked granulocytic hyperplasia with predominantly mature forms. Peripheral leukocytosis did not occur. Penicillin, streptomycin, and Mycostatin were discontinued on the 16th day, sulfamerazine two days later, and novobiocin on the 22d day. On the 29th day the patient was returned to the Psychiatric Service, with warning against any future use of chlorpromazine and emphasis on the imperative need of immediate leukocyte count in the event of recurrence of sore mouth or throat of any cause.

Comment

Agranulocytosis in this case cannot be attributed with certainty to hypersensitivity to chlorpromazine, inasmuch as the patient had received additional drugs, some of which (pyribenzamine, phenobarbital, pentobarbital, acetphenetidin) have been implicated as agranulocytic agents. The timing of onset favors chlorpromazine as the responsible drug.

Agranulocytosis is most frequent in women past middle age. Despite the preponderance of male patients at Winter Veterans Administration Hospital, this woman is the first patient in whom agranulocytosis has been encountered following chlorpromazine

therapy. The syndrome is independent of dosage and usually develops after 4 to 8 weeks of treatment, though previous administration may hasten the onset and later onset is always possible. Following recovery, established sensitivity has been demonstrated repeatedly, indicated by complete disappearance of granulocytes from the peripheral blood within 6 to 10 hours of administration of a small dose; the hazard of this test does not warrant its clinical use.

A leukocyte-agglutinating plasma globulin¹ presumably brings about destruction of the agglutinated leukocytes. Bone marrow exhaustion follows. The globulin is presumably a leukocytotropic antibody formed in response to antigen consisting of drug combined with a plasma protein.²

With removal of the offending drug, the syndrome is self-limited. Recovery is assured by antibiotic therapy designed to protect the patient until the normal granulocytic barrier against infection is restored. Those regions normally harboring bacteria (the throat and perineum) are most susceptible to spreading infection when the granulocytic defense is withdrawn.

Adrenocortical therapy is now frequently employed in the hope of hastening recovery of the bone marrow and of inhibiting the antigen-antibody reaction which precipitates agranulocytosis. It has not yet been shown to speed recovery, but the disease is so infrequent as to make judgment difficult. Such therapy increases the hazard of spread of infection, for which reason it was not employed in this case. Since deaths are invariably due to infection, this is an important point, and it should be resolved by studies involving treatment of alternate cases at medical centers large enough to encounter a sufficient number.

Winter Veterans Administration Hospital
Topeka, Kansas

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The function of play is to balance life in relation to work, to afford a refreshing contrast to responsibility and routine, to keep alive that spirit of adventure and that sense of proportion which prevents taking oneself and one's job too seriously, and thus to avert the premature death of youth, and not infrequently the premature death of man himself.

—Austin Fox Riggs

Medical Services

Distribution of Physicians and General Hospital Beds in Kansas in 1955

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The availability of facilities for the practice of medicine is an important factor in the distribution of physicians and their services. So as an indication of these facilities in Kansas it was decided to include in this study a survey of the distribution of general hospital beds in relation to the distribution of physicians.

The Division of Hospital Facilities of the Kansas State Board of Health provided information relative to the distribution of general hospital beds. This data was obtained from Hospital Construction Plan, Kansas State Board of Health, Hospital Facilities Division, July 1, 1955.

Kansas Hospital Facilities

The Kansas Hospital Survey and Construction Act became a law in April, 1947. Under this act the Division of Hospital Facilities of the State Board of Health was established, and the Kansas Advisory Hospital Council was appointed by the governor.

The Licensing Act became law June 30, 1947. This law designates the Kansas State Board of Health as the agency to adopt standards and regulations and to administer the licensing program. The Division of Hospital Facilities and the Kansas Advisory Hospital Council perform this function.

Hospital Regions

The state has been divided into seven hospital regions, namely: 1. Kansas City, 2. Pittsburg, 3. Topeka, 4. Salina, 5. Wichita, 6. Hays, and 7. Dodge City. See Figure 1.

The author is chairman of the Department of Public Health and Preventive Medicine, University of Kansas Medical Center.

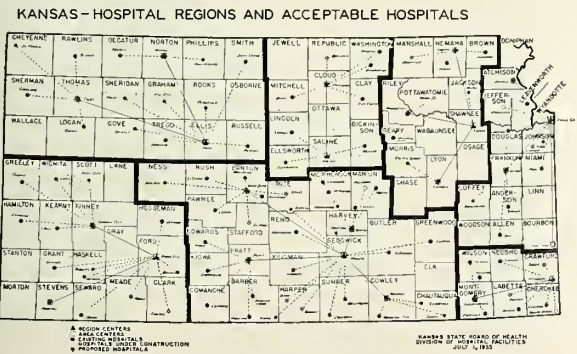


Figure 1.

Each region is designated by the name of the city where the regional center is located. The regions and their respective centers were determined on the basis of existing trade, transportation, and communication patterns. The referral of patients, hospital relationships, and patient preferences generally follow these patterns.

This is the concluding installment of a three-part series which began in the Journal in April and was continued in May.

Hospital Areas

The seven hospital regions are further sub-divided into 23 general hospital service areas, with a center assigned to each area. See Figure 2. These areas are designated by the letters B, I, or R, depending upon whether they are considered as Base, Intermediate, or Rural Areas.

Note: Since the map in Figure 2 was issued the hospitals at Winchester and Attica have been completed.

Ratio of Hospital Beds to Population

Kansas has over 12.0 people per square mile, and therefore regulations under Public Law 725 permit an over-all state ratio of 4.5 beds per thousand population. The same regulations specify a minimum of 4.5 beds per thousand in base areas, 4.0 beds per thousand in intermediate areas, and 2.5 beds per thousand in rural areas.

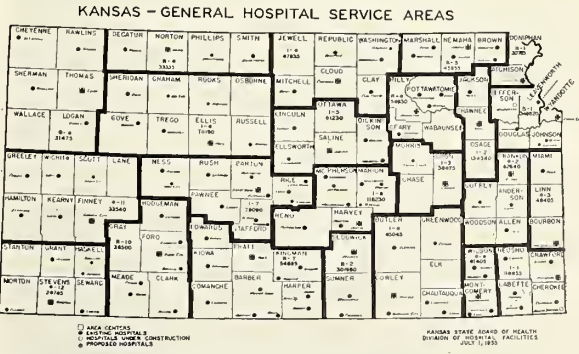


Figure 2. Since this map was issued, hospitals at Winchester and Attica have been completed.

The following table shows the number of general hospitals and acceptable hospital beds in each hospital service area of Kansas.

| GENERAL HOSPITALS IN KANSAS | | | | |
|-----------------------------|------|------------------|------------------------|----------------------------|
| Region | Area | No. of Hospitals | No. of Acceptable Beds | No. of Non-Acceptable Beds |
| Kansas City | B-1 | 13 | 1359 | 341 |
| | R-1 | 1 | 100 | 0 |
| | R-2 | 4 | 144 | 0 |
| | R-3 | 2 | 201 | 85 |
| Regional Total | | 20 | 1804 | 426 |
| Pittsburg | I-1 | 7 | 291 | 79 |
| | R-4 | 4 | 261 | 14 |
| Regional Total | | 11 | 552 | 93 |
| Topeka | I-2 | 4 | 423 | 33 |
| | I-3 | 3 | 213 | 0 |
| | R-5 | 4 | 119 | 83 |
| | R-6 | 3 | 159 | 96 |
| Regional Total | | 14 | 914 | 212 |
| Salina | I-4 | 6 | 259 | 26 |
| | I-5 | 5 | 405 | 39 |
| Regional Total | | 11 | 664 | 65 |
| Wichita | B-2 | 9 | 1278 | 40 |
| | I-6 | 11 | 699 | 32 |
| | I-7 | 10 | 356 | 105 |
| | I-8 | 7 | 438 | 28 |
| | R-7 | 11 | 256 | 45 |
| Regional Total | | 48 | 3027 | 250 |
| Hays | I-9 | 8 | 323 | 0 |
| | R-8 | 4 | 97 | 0 |
| | R-9 | 5 | 198 | 0 |
| Regional Total | | 17 | 618 | 0 |
| Dodge City | R-10 | 6 | 152 | 41 |
| | R-11 | 6 | 125 | 59 |
| | R-12 | 5 | 93 | 51 |
| Regional Total | | 17 | 370 | 151 |
| STATE TOTALS | | 138 | 7949 | 1197 |

Source: Annual Revision, Kansas State Plan, 1955.

Note: Beds are classified as non-acceptable if they are located in buildings that are not of fire-resistant construction or have other serious deficiencies in fire protection. This designation does not reflect in any way on the medical care and treatment program of the hospital. Many of them provide excellent care even though the physical plant is obsolete.

DISTRIBUTION OF GENERAL HOSPITAL BEDS BY HOSPITAL AREAS

| Area and Region | Beds per 1,000 Population |
|-----------------|---------------------------|
| Kansas City | |
| B-1 | 3.8 |
| R-1 | 3.2 |
| R-2 | 2.2 |
| R-3 | 4.3 |
| Pittsburg | |
| I-1 | 2.4 |
| R-4 | 4.2 |
| Topeka | |
| I-2 | 3.1 |
| I-3 | 5.8 |
| R-5 | 2.5 |
| R-6 | 2.7 |
| Salina | |
| I-4 | 3.8 |
| I-5 | 5.0 |
| Wichita | |
| B-2 | 4.2 |
| I-6 | 5.8 |
| I-7 | 4.5 |
| I-8 | 4.6 |
| R-7 | 4.6 |
| Hays | |
| I-9 | 4.6 |
| R-8 | 2.9 |
| R-9 | 6.3 |
| Dodge City | |
| R-10 | 4.1 |
| R-11 | 3.6 |
| R-12 | 3.4 |

STATE HOSPITAL PLAN STATISTICS OF INTEREST

(1) An excess of general hospital beds (beds in excess of statewide ratio of 4.5 beds per 1,000 population from Kansas State Plan for Hospital Construction) exists in the following areas (see map):

| Region | Area | Counties | Approximate Population of Area | Number of Beds in Excess of State Ratio |
|--------|------|---|--------------------------------|---|
| Topeka | I-3 | Chase Lyon Morris | 36,875 | 47 |
| Salina | I-5 | Ottawa Lincoln Dickinson Saline Ellsworth | 81,230 | 39 |

**STATE HOSPITAL PLAN STATISTICS
OF INTEREST
(Continued)**

| <i>Region</i> | <i>Area</i> | <i>Counties</i> | <i>Approximate Pop- ulation of Area</i> | <i>Number of Beds in Ex- cess of State Ratio</i> |
|---------------|-------------|---|---|--|
| Wichita | I-6 | Marion McPherson Harvey Reno | 118,230 | 167 |
| Wichita | I-8 | Butler Greenwood Elk Cowley Chautauqua | 95,045 | 10 |
| Wichita | R-7 | Edwards Pratt Kiowa Barber Kingman Harper Comanche | 54,695 | 10 |
| Hays | R-9 | Cheyenne Rawlins Thomas Sherman Wallace Logan | 31,475 | 56 |
| Hays | I-9 | Sheridan Graham Rooks Osborne Russell Ellis Trego Gove | 70,190 | 7 |
| TOTAL | | | | 336 |

Hospitals in the following locations had a bed occupancy rate of less than 50 per cent.

| <i>Area</i> | <i>City or Town</i> | <i>County</i> |
|-------------|---------------------|---------------|
| R-2 | Burlington | Coffey |
| I-1 | Girard | Crawford |
| I-1 | Pittsburg | Crawford |
| R-4 | Fredonia | Wilson |
| I-3 | Council Grove | Morris |
| R-5 | Marysville | Marshall |
| R-5 | Seneca | Nemaha |
| R-5 | Sabetha | Nemaha |
| R-6 | Manhattan | Riley |
| R-6 | Onaga | Pottawatomie |
| I-4 | Hanover | Washington |
| I-4 | Washington | Washington |
| I-5 | Ellsworth | Ellsworth |
| I-5 | Lincoln | Lincoln |
| I-5 | Salina | Saline |

| <i>Area</i> | <i>City or Town</i> | <i>County</i> |
|-------------|---------------------|---------------|
| B-2 | Wichita | Sedgwick |
| I-6 | Marion | Marion |
| I-6 | Goessel | Marion |
| I-6 | Moundridge | McPherson |
| I-7 | Hoisington | Barton |
| I-7 | Ellinwood | Barton |
| I-7 | Ness City | Ness |
| I-7 | Larned | Pawnee |
| I-7 | Little River | Rice |
| I-8 | El Dorado | Greenwood |
| I-8 | Arkansas City | Cowley |
| R-7 | Kingman | Kingman |
| R-7 | Hardtner | Barber |
| R-7 | Anthony | Harper |
| I-9 | Wakeeney | Trego |
| I-9 | Hoxie | Sheridan |
| R-9 | Atwood | Rawlins |
| R-9 | Colby | Thomas |
| R-9 | Oakley | Logan |
| R-9 | St. Francis | Cheyenne |
| R-9 | Goodland | Sherman |
| R-10 | Bucklin | Ford |
| R-10 | Spearsville | Ford |
| R-10 | Jetmore | Hodgeman |
| R-10 | Fowler | Meade |
| R-11 | Garden City | Finney |
| R-11 | Lakin | Kearny |
| R-11 | Syracuse | Hamilton |
| R-11 | Tribune | Greeley |
| R-11 | Leoti | Wichita |
| R-12 | Satanta | Haskell |
| R-12 | Liberal | Seward |

Kansas State Board of Health, Division of Hospital Facilities, July 1, 1955.

A question which arises is, "What has been the effect of the Hill-Burton Act on hospital construction in Kansas?" At a meeting on May 21, 1953, the Kansas Advisory Hospital Council took action in recommending that no application for federal funds be favorably considered for a new hospital in any area that does not have at least 70 per cent occupancy in existing hospitals.

**HOSPITALS CONSTRUCTED IN KANSAS
WITH THE AID OF HILL-BURTON
ACT FUNDS**

| <i>Location</i> | <i>Name of Hospital</i> | <i>Number of Beds NEW ADD'N</i> |
|-----------------|-------------------------|---|
| Atchison | *Atchison | 42 |
| Burlington | Coffey County | 20 |
| Coffeyville | Coffeyville Memorial . | 74 |
| Coldwater | Comanche County ... | 18 |
| Columbus | Maude Norton Mem. . | 22 |

HOSPITALS CONSTRUCTED IN KANSAS
WITH THE AID OF HILL-BURTON
ACT FUNDS
(Continued)

| <i>Location</i> | <i>Name of Hospital</i> | <i>Number of Beds NEW ADD'N</i> |
|-----------------|--|---|
| Council Grove | Morris County | 30 |
| El Dorado | Susan B. Allen Mem. . | 47 |
| Fort Scott | *Mercy | 173 |
| Fredonia | St. Margaret's Mercy . | 44 |
| Garnett | Anderson County | 30 |
| Goodland | Boothroy Memorial .. | 30 |
| Greensburg | Kiowa County Memorial | 20 |
| Iola | Allen County | 30 |
| Kansas City | Univ. of Kansas Med. Center—Chest Dis- ease Unit | 116 |
| Kansas City | *Univ. of Kansas Med. Center—Psychi- atric Unit | 77 |
| Kansas City | *Bethany | 94 |
| Kansas City | *Providence | 10 |
| Kingman | Kingman | 7 |
| Kinsley | Edwards County | 21 |
| LaCrosse | Rush County | 20 |
| Larned | St. Joseph Memorial . | 48 |
| Lawrence | *Lawrence Memorial .. | 86 |
| Manhattan | Riley County | 95 |
| Marion | St. Luke | 30 |
| Medicine Lodge | Medicine Lodge Memorial | 24 |
| Norton | Norton County | 31 |
| Oberlin | Decatur County | 22 |
| Ottawa | Ransom Memorial ... | 30 |
| Paola | Miami County | 28 |
| Phillipsburg | Phillips County Community | 18 |
| Pittsburg | Mount Carmel | 48 |
| Pratt | Pratt County | 63 |
| Quinter | Gove County | 20 |
| Smith Center | Smith County Memorial | 26 |
| Topeka | Stormont-Vail | 130 |
| Topeka | St. Francis | 40 |
| Topeka | Menninger Foundation (Mental) | 64 |
| TOTAL | | 907 821 |

* Under construction.

Kansas State Board of Health, Division of Hospital Facilities, September 27, 1955.

HOSPITALS CONSTRUCTED IN KANSAS
SINCE 1946 WITHOUT THE AID OF
HILL-BURTON ACT FUNDS

| <i>Location</i> | <i>Name of Hospital</i> | <i>Number of Beds NEW ADD'N</i> |
|-----------------|--|---|
| Arkansas City | Arkansas City Memorial | 91 |
| Atchison | Atchison | Remod. |
| Attica | *Attica District | 12 |
| Atwood | Rawlins County | 32 |
| Baxter Springs | Baxter Springs Memorial | 34 |
| Bird City | Bird City | 4 (now closed) |
| Bucklin | Bucklin Clinic | 7 |
| Cedar Vale | Hays | 10 |
| Chanute | Neosho County | 50 10 |
| Coffeyville | Coffeyville Memorial .. | 53 |
| Columbus | Maude Norton Memorial | 17 |
| Concordia | St. Joseph | 150 |
| Ellinwood | Ellinwood District | 30 |
| Ellsworth | Ellsworth Co. Vet. Memorial | 29 |
| Emporia | Newman Memorial ... | 40 |
| Eureka | *Greenwood County ... | 45 |
| Hanover | Hanover Clinic & Hospital | 10 |
| Hardtner | Achenbach Memorial .. | 15 |
| Hays | Hadley Memorial | 41 |
| Hiawatha | Hiawatha | 33 |
| Hill City | Graham County | 17 |
| Hillsboro | *Salem | 32 |
| Hoisington | Hoisington Lutheran .. | 45 |
| Hoxie | Sheridan County | 14 |
| Hugoton | Stevens County | 22 |
| Hutchinson | Grace | 80 |
| Hutchinson | St. Elizabeth | 50 |
| Jetmore | Hodgeman County | 11 |
| Kansas City | Univ. of Kansas Medical Center | 53 |
| Kansas City | St. Margaret's | 200 |
| Kiowa | Kiowa District | 6 |
| Lakin | Kearny County | 22 |
| Leoti | Wichita County | 12 |
| Liberal | Epworth | 30 |
| Lincoln | Lincoln County | 20 |
| Meade | Meade District | 16 |
| Moundridge | Mercy | 7 |
| Ness City | Ness County | 16 |
| Newton | Central Area (Mental) | 40 |
| Newton | Axtel Christian | 12 |
| Oakley | Logan County | 22 |
| Olathe | Olathe Community | 30 |
| Plainville | Plainville Rural District | 24 |
| Salina | Asbury | 30 |
| Salina | St. John's | 30 |

* Under construction.

HOSPITALS CONSTRUCTED IN KANSAS
SINCE 1946 WITHOUT THE AID OF
HILL-BURTON ACT FUNDS
(Continued)

| <i>Location</i> | <i>Name of Hospital</i> | <i>Number of Beds</i> | <i>NEW ADD'N</i> |
|-----------------|-------------------------------|---------------------------|------------------|
| Satanta | Satanta District | 14 | |
| Scott City | Scott County | 24 | |
| Sedan | Sedan City | 28 | |
| Seneca | Seneca | | 15 |
| St. Francis | Cheyenne County | 26 | |
| Sterling | Sterling Community | 23 | |
| Sublette | Community | 12 | |
| Tribune | Greeley County | 23 | |
| Ulysses | Grant County | 24 | |
| Wakeeney | Trego County | 28 | |
| Washington | Washington County | 32 | |
| Wellington | St. Lukes | | 10 |
| Wichita | St. Francis | | 110 |
| Wichita | St. Joseph | | 114 |
| Wichita | Sedgwick County | 150 | |
| Wichita | Osteopathic | | 20 |
| Winchester | *Winchester | 22 | |
| Winfield | Wm. Newton Memorial | | 40 |
| TOTAL | | 1421 | 848 |

* Under construction.

(Note: The hospitals at Winchester and Attica have since been completed.)

Let us see the distribution of physicians in the various hospital service areas of Kansas. Table XXV gives this information and also the number of persons per physician in each area.

TABLE XXV
HOSPITAL SERVICE AREAS IN KANSAS
—1955

| <i>Region</i> | <i>Area</i> | <i>County</i> | <i>Number of M.D.'s</i> | <i>Persons Per M.D.</i> |
|---------------|-------------|---------------|-----------------------------|---------------------------------|
| Kansas City | R-1 | Doniphan | 7 | 1543 |
| | | Atchison | 18 | 1152 |
| | *Area | | 25 | 1261 |
| | B-1 | Jefferson | 10 | 1119 |
| | | Leavenworth | 40 | 876 |
| | | Douglas | 50 | 641 |
| | | Wyandotte | 361 | 525 |
| | | Johnson | 53 | 1987 |
| | *Area | | 514 | 724 |
| | R-2 | Franklin | 17 | 1191 |
| | | Coffey | 6 | 1533 |
| | | Anderson | 7 | 1435 |
| | | Allen | 16 | 1084 |

* Total number of physicians and number of persons per physician in the area.

TABLE XXV (Cont.)
HOSPITAL SERVICE AREAS IN KANSAS
—1955

| <i>Region</i> | <i>Area</i> | <i>County</i> | <i>Number of M.D.'s</i> | <i>Persons Per M.D.</i> |
|---------------|-------------|---------------|-----------------------------|---------------------------------|
| Pittsburg | R-3 | Woodson | 4 | 1531 |
| | | *Area | 50 | 1260 |
| | | Miami | 22 | 854 |
| | R-4 | Linn | 5 | 1829 |
| | | Bourbon | 15 | 1186 |
| | | *Area | 42 | 1089 |
| | I-1 | Wilson | 9 | 1646 |
| | | Montgomery | 39 | 1226 |
| | | *Area | 48 | 1305 |
| | I-2 | Neosho | 13 | 1586 |
| | | Labette | 32 | 945 |
| | | Crawford | 43 | 979 |
| | *Area | Cherokee | 16 | 1531 |
| | | *Area | 104 | 1129 |
| | | R-5 | 17 | 1033 |
| Topeka | R-5 | Marshall | 14 | 996 |
| | | Nemaha | 9 | 1636 |
| | | Brown | 9 | 1636 |
| | *Area | | 40 | 1155 |
| | I-2 | Jackson | 3 | 3539 |
| | | Shawnee | 315 | 365 |
| | | Osage | 6 | 2184 |
| | *Area | | 324 | 428 |
| | R-6 | Riley | 28 | 941 |
| | | Pottawatomie | 9 | 1347 |
| | | Wabaunsee | 2 | 3443 |
| | *Area | Geary | 13 | 1466 |
| | | *Area | 52 | 1234 |
| | | I-3 | 6 | 1380 |
| Salina | I-3 | Morris | 31 | 785 |
| | | Lyon | 4 | 1200 |
| | | Chase | 41 | 913 |
| | *Area | | 41 | 913 |
| | I-4 | Jewell | 6 | 1510 |
| | | Republic | 8 | 1335 |
| | | Washington | 8 | 1580 |
| | *Area | Mitchell | 11 | 885 |
| | | Cloud | 22 | 717 |
| | | Clay | 8 | 1388 |
| | I-5 | *Area | 63 | 845 |
| | | Lincoln | 3 | 2196 |
| | | Ottawa | 4 | 1761 |
| | *Area | Dickinson | 17 | 1285 |
| | | Ellsworth | 10 | 910 |
| | | Saline | 50 | 803 |
| | *Area | | 84 | 1009 |

* Total number of physicians and number of persons per physician in the area.

TABLE XXV (Cont.)
HOSPITAL SERVICE AREAS IN KANSAS
—1955

| Region | Area | County | Number of M.D.'s | Persons Per M.D. |
|------------|-------|------------|------------------------|------------------------|
| Wichita | I-7 | Ness | 3 | 2040 |
| | | Rush | 5 | 1419 |
| | | Barton | 25 | 1356 |
| | | Pawnee | 14 | 695 |
| | | Rice | 13 | 1164 |
| | | Stafford | 7 | 1243 |
| | *Area | | 67 | 1204 |
| | I-6 | Marion | 14 | 1174 |
| | | McPherson | 17 | 1386 |
| | | Reno | 49 | 1181 |
| | | Harvey | 60 | 401 |
| | *Area | | 140 | 871 |
| | I-8 | Butler | 21 | 1714 |
| | | Greenwood | 7 | 1790 |
| | | Elk | 1 | 6074 |
| | | Cowley | 39 | 930 |
| | | Chautauqua | 4 | 1688 |
| | *Area | | 72 | 1362 |
| | B-2 | Sedgwick | 401 | 741 |
| | | Sumner | 25 | 1056 |
| | *Area | | 426 | 760 |
| | R-7 | Edwards | 5 | 1164 |
| | | Pratt | 11 | 1145 |
| | | Kiowa | 6 | 796 |
| | | Barber | 6 | 1526 |
| | | Harper | 11 | 927 |
| | | Comanche | 4 | 908 |
| | | Kingman | 8 | 1357 |
| | *Area | | 51 | 1118 |
| Dodge City | R-10 | Hodgeman | 1 | 3379 |
| | | Ford | 20 | 967 |
| | | Gray | 1 | 4883 |
| | | Clark | 3 | 1219 |
| | | Meade | 5 | 1059 |
| | *Area | | 30 | 1217 |
| | R-12 | Stanton | 1 | 1980 |
| | | Grant | 1 | 4677 |
| | | Haskell | 3 | 908 |
| | | Morton | 2 | 1436 |
| | | Stevens | 3 | 1425 |
| | | Seward | 9 | 1297 |
| | *Area | | 19 | 1484 |
| | R-11 | Lane | 1 | 3101 |
| | | Scott | 4 | 1256 |
| | | Wichita | 2 | 1335 |
| | | Greeley | 1 | 2099 |
| | | Hamilton | 2 | 1600 |
| | | Kearney | 2 | 1541 |
| | | Finney | 11 | 1297 |
| | *Area | | 23 | 1445 |

* Total number of physicians and number of persons per physician in the area.

TABLE XXV (Cont.)
HOSPITAL SERVICE AREAS IN KANSAS
—1955

| Region | Area | County | Number of M.D.'s | Persons Per M.D. |
|--------|--------|----------|------------------------|------------------------|
| Hays | R-9 | Cheyenne | 7 | 729 |
| | | Rawlins | 4 | 1428 |
| | | Sherman | 7 | 1004 |
| | | Thomas | 7 | 1074 |
| | | Wallace | 5 | 478 |
| | | Logan | 1 | 4243 |
| | *Area | | 31 | 1032 |
| | R-8 | Decatur | 6 | 1016 |
| | | Norton | 13 | 694 |
| | | Phillips | 5 | 2047 |
| | | Smith | 6 | 1400 |
| | | *Area | 30 | 1125 |
| | I-9 | Sheridan | 1 | 4539 |
| | | Graham | 4 | 1358 |
| | | Rooks | 7 | 1449 |
| | | Osborne | 6 | 1402 |
| | | Gove | 3 | 1463 |
| | | Trego | 5 | 1081 |
| | | Ellis | 28 | 704 |
| | | Russell | 10 | 1327 |
| | *Area | | 64 | 1114 |
| | *STATE | | 2340 | 876 |

* Total number of physicians and number of persons per physician in the area.

Table XXVI shows the per cent of the state's population in each hospital service area, the average age of the physicians practicing in each area, and the per cent of physicians in the most effective age group (30-59 years) in each area.

TABLE XXVI
AVERAGE AGES OF PRACTICING PHYSICIANS IN THE HOSPITAL SERVICE AREAS OF KANSAS

| Hospital Service Area | Per Cent of State's Population | Average/or Mean Age of Physicians in Years | Per Cent in Most Effective Age Group (30-59 Years) |
|-----------------------|--------------------------------|--|--|
| B-1 | 18.3 | 42.1 | 85.7% |
| R-1 | 1.1 | 53.9 | 60.8% |
| R-2 | 3.0 | 57.3 | 62.0% |
| R-3 | 2.2 | 56.9 | 57.1% |
| I-1 | 5.8 | 53.8 | 59.6% |
| R-4 | 3.0 | 50.1 | 72.9% |
| R-5 | 2.3 | 52.5 | 65.0% |

TABLE XXVI
AVERAGE AGES OF PRACTICING PHYSICIANS IN THE HOSPITAL SERVICE AREAS OF KANSAS

(Continued)

| <i>Hospital Service Area</i> | <i>Per Cent of State's Population</i> | <i>Average or Mean Age of Physicians in Years</i> | <i>Per Cent in Most Effective Age Group (30-59 Years)</i> |
|------------------------------|---------------------------------------|---|---|
| R-6 | 3.1 | 51.1 | 69.8% |
| I-2 | 6.8 | 43.2 | 82.4% |
| I-3 | 1.9 | 53.4 | 80.6% |
| I-5 | 4.1 | 50.8 | 69.0% |
| I-4 | 3.3 | 56.3 | 58.7% |
| B-2 | 15.8 | 44.4 | 81.3% |
| I-6 | 6.0 | 51.4 | 67.8% |
| I-7 | 4.0 | 50.3 | 69.1% |
| I-8 | 4.8 | 50.9 | 72.2% |
| R-7 | 2.8 | 49.1 | 72.5% |
| I-9 | 3.5 | 47.4 | 71.8% |
| R-8 | 1.7 | 53.3 | 60.0% |
| R-9 | 1.6 | 48.2 | 70.9% |
| R-10 | 1.8 | 45.5 | 80.0% |
| R-11 | 1.7 | 43.1 | 82.6% |
| R-12 | 1.4 | 46.4 | 84.2% |
| STATE | 100.0 | *47.0 | **65.8% |

* Not an arithmetical average of above figures, but an average of the ages of all physicians in the state.

** Not an arithmetical percentage of above figures, but the percentage of all physicians in the state.

The average age of all physicians in Kansas is 47 years. Table XXVI indicates that in Base Area 1, which includes Douglas, Jefferson, Johnson, Leavenworth, and Wyandotte Counties, the average age of physicians is 42.1 years, the youngest in the state. Undoubtedly this figure is weighted by the number of young men in Wyandotte County who are serving internships and residencies at the University of Kansas Medical Center. And 89.7 per cent of the physicians in this area are in the most effective age group, the highest per cent in the state.

In Rural Area 2, which includes Anderson, Allen, Coffey, Franklin, and Woodson Counties, the average age of physicians is 57.3 years. This is the oldest average age in the state. However, Rural Area 3, which includes Bourbon, Linn, and Miami Counties, is the area which has the lowest per cent of physicians in the most effective age group, as compared with all hospital service areas in the state.

Table XXVII shows the relationship between density of general hospital beds (in beds per 1,000 population) and physicians' services. It is seen that 48.7 per cent of the state's population lives in hospital

TABLE XXVII
DISTRIBUTION OF PHYSICIANS IN RELATION TO GENERAL HOSPITAL BEDS

| <i>General Hospital Beds Per 1,000 of Population</i> | <i>Per Cent of State's Pop.</i> | <i>Persons Per Physician</i> |
|--|---------------------------------|------------------------------|
| 0.0 to 1.9 | 0 | 0 |
| 2.0 to 3.9 | 48.7 | 802.7 |
| 4.0 and over | 51.3 | 991.8 |
| STATE— | 100.0 | *876.0 |

* Not an arithmetical average of above figures, but the number of persons per physician in the state.

service areas with 3.9 acceptable general hospital beds or less per 1,000 population. However, no area has less than 2 beds per 1,000 population. The average number of persons per physician for the entire state is 876. In those areas having 2.0 to 3.9 general hospital beds per 1,000 population there are 802.7 persons per physician. In the hospital service areas with 4 or more beds per 1,000 population, there are 991.8 persons per physician. So the difference is not too great.

TABLE XXVIII
DISTRIBUTION OF PHYSICIANS' SERVICES BY ACCEPTABLE GENERAL HOSPITAL BEDS PER 1,000 POPULATION

| <i>Beds Per 1,000</i> | <i>Number of Physicians</i> | | | | |
|-----------------------|--------------------------------|-------------|----------------------------|-----------------------------|--------------|
| | <i>% OF STATE'S POPULATION</i> | <i>K.U.</i> | <i>OTHER KANS. SCHOOLS</i> | <i>OUT OF STATE SCHOOLS</i> | <i>TOTAL</i> |
| 0.0-1.9 | 0 | 0 | 0 | 0 | 0 |
| 2.0-3.9 | 48.7 | 497 | 40 | 707 | 1244 |
| 4.0 & over | 51.3 | 460 | 16 | 620 | 1096 |
| STATE | 100.0 | 957 | 56 | 1327 | 2340 |

Table XXVIII shows the distribution of physicians by acceptable general hospital beds per 1,000 population in relation to the school of graduation. Kansas University graduates are about evenly divided between those areas with 2 to 3.9 beds per 1,000 population and those areas with 4 or more beds per 1,000 population. On the other hand, there are more out of state graduates in the former area than in the latter.

Of the 1,244 physicians practicing in areas with 2 to 3.9 beds per 1,000 population, 39.9 per cent are Kansas University graduates and 56.8 per cent are graduates of out of state schools. Of the 1,096 physi-

cians in areas with 4 or more beds per 1,000 population, 41.7 per cent are Kansas University graduates and 56.3 per cent have graduated from out of state schools.

TABLE XXIX
DISTRIBUTION OF PHYSICIANS BY HOSPITAL SERVICE AREAS OF KANSAS AND SPECIALIZATION

| Number of Physicians | | | | | |
|----------------------|------|----------------|--------------------|---------------------|-------|
| SPECIALTY | | | | | |
| SERVICE AREA | | CER- TIFIED | NON-CER- TIFIED | GENERAL PRACTICE | TOTAL |
| Kansas City | B-1 | 96 | 173 | 245 | 514 |
| | R-1 | 3 | 3 | 19 | 25 |
| | R-2 | 0 | 10 | 40 | 50 |
| | R-3 | 3 | 7 | 32 | 42 |
| Pittsburg | I-1 | 6 | 18 | 80 | 104 |
| | R-4 | 0 | 2 | 46 | 48 |
| Topeka | R-5 | 1 | 2 | 37 | 40 |
| | R-6 | 4 | 6 | 42 | 52 |
| | I-2 | 86 | 122 | 116 | 324 |
| Salina | I-3 | 9 | 4 | 28 | 41 |
| | I-5 | 18 | 12 | 54 | 84 |
| | I-4 | 4 | 15 | 44 | 63 |
| Wichita | B-2 | 104 | 138 | 184 | 426 |
| | I-6 | 21 | 16 | 103 | 140 |
| | I-7 | 2 | 9 | 56 | 67 |
| | I-8 | 10 | 15 | 47 | 72 |
| Hays | R-7 | 0 | 0 | 51 | 51 |
| | I-9 | 5 | 4 | 55 | 64 |
| | R-8 | 0 | 4 | 26 | 30 |
| Dodge City | R-9 | 1 | 4 | 26 | 31 |
| | R-10 | 3 | 3 | 24 | 30 |
| | R-11 | 1 | 1 | 21 | 23 |
| | R-12 | 1 | 2 | 16 | 19 |
| STATE | | 378 | 570 | 1392 | 2340 |

Table XXIX gives the number of physicians as certified specialists, non-certified specialists, and general practitioners in each hospital service area of Kansas.

Summary

A general hospital has been defined as "any hospital for inpatient medical or surgical care of acute illness or injury and for obstetrics, of which not more than 50 per cent of the total patient days during the year are customarily assignable to the following categories of cases: chronic, convalescent and rest, drug and alcoholic, epileptic, mentally deficient, nervous and mental, and tuberculosis."

The Kansas Hospital Construction Plan is revised

annually. The Hill-Burton Act was amended and expanded by Public Law 482 of the 83rd Congress to include, besides general hospitals, four new categories of medical facilities: rehabilitation facilities, diagnostic and treatment centers, hospitals for the chronically ill, and nursing homes. However, in this study only general hospital facilities have been included.

Kansas, with a population of 2,050,478, has 7,949 acceptable general hospital beds, or a rate of 3.8 beds per 1,000 population. No hospital service area in the state has less than 2 beds per 1,000 population. Rural Area 2, which includes Anderson, Allen, Coffey, Franklin, and Woodson Counties has the lowest rate in the state—2.2 beds per 1,000 population. There is a higher ratio of persons per physician in those areas with 4 or more beds per 1,000 than in those areas with 2 to 3.9 beds per 1,000 population.

General Discussion

There are many questions which have been left unanswered in this study of the distribution of physicians, physicians' services, and general hospital beds in Kansas.

No attempt has been made to assess the quality of medical care by physicians in Kansas. Therefore, this has been purely a quantitative survey. The quality of general hospital beds has been noted as acceptable or non-acceptable, in accordance with the "Hospital Construction Plan" of the state. Non-acceptable or unsuitable beds are those in an institution which is considered to constitute a public hazard. These facilities are considered as being non-acceptable only from the structural standpoint. This designation reflects in no way on the medical care and treatment program. So again, the quality of medical care provided by physicians in hospitals has not been involved in the survey of physicians in relation to general hospital facilities.

This study has used geographical areas of the state, rather than population characteristics, as the basis for a survey of variation in physicians' services and hospital services. For this purpose, the division of the state into 23 hospital service areas, according to the Kansas Hospital Construction Plan, was used.

The over-all ratio of the number of persons per physician in Kansas was found to be 876. As was to be expected, there was rather wide variation of this ratio in different parts of the state. Shawnee County had a ratio of 365 persons per physician, which was the lowest in the state, as compared with Gray County with 4,883 persons per physician, which was the highest in the state. One cannot set up a standard ratio which would be applicable to all areas, as many factors enter into the matter, such as distance, accessibility, etc.

The average age of all physicians in Kansas today is 47 years, which is younger than was expected. Per-

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Intoxication with Thiocyanate

Report of One Case and Review of the Literature

A. H. GREENHOUSE, M.D., *Garden City*

The physician who is confronted with a bizarre and peculiar clinical picture must always consider the possibility of an intoxication, be it with medication, food, beverage, or industrial, chemical, or noxious gas. Likewise, in prescribing a medicine, its toxic potential must always be borne in mind, for even a cursory perusal of the recent literature would convince the most skeptical that practically any drug is likely to produce an untoward reaction.

Among hazardous medicines employed by doctors, potassium thiocyanate has always occupied a prominent position. Yet, despite its well advertised dangers, it is surprising to discover that this medication is still widely employed without any regard to the potential hazards involved. At a recent hospital staff meeting, when the case to be described below was discussed, several physicians stated that they still employed potassium thiocyanate in the treatment of hypertension, considered it innocuous, and never checked thiocyanate blood levels. As will be pointed out in the discussion to follow, most authorities do not consider potassium thiocyanate effective in the treatment of high blood pressure, and all experienced in its use consider it extremely dangerous. The following case of intoxication with this medicine occurred insidiously while the patient was under medical supervision.

Case Report

The patient is a 58-year-old white female employed in a clerical position. She was first seen in the office on September 13, 1956, at which time she complained that she had felt "peculiar" for several months and had had progressive visual difficulty in recent weeks. She stated, "Things blur and I just can't see right." She had not been able to see figures properly while doing bookkeeping and had made many errors while calculating. Two weeks prior to this consultation she had had her eyes refracted, and new glasses were prescribed without benefit.

She also complained that in recent weeks her hearing had become defective, although she was unable to state precisely what she had considered wrong. Her appetite was good, she had lost no weight, but she did complain of intermittent nausea, weakness, dizziness, and difficulty in thinking. Her son stated that she talked peculiarly and that on several occasions she had seemed confused and irrational.

Of great importance in her past medical history was the fact that for about 15 years she had been treated for hypertension with some "red tablets." She had taken a variable amount of this medicine but recently had been on "two or three" tablets twice daily. During this entire period she had received periodic checks by a physician, but at no time had blood studies of any type been made. Conversation with the patient's druggist confirmed that she had been taking potassium thiocyanate.

The patient described is a 58-year-old white female who had been using thiocyanates for 15 years without adequate safeguards to avoid poisoning. Symptoms of intoxication included visual and auditory hallucinations, anemia, lethargy, and mental confusion. It is emphasized that side effects of the drug may threaten life and that the physician must be alert in diagnosing obscure clinical syndromes.

Physical examination revealed a chronically ill-appearing, pale, white female who was obviously hard of hearing. Her blood pressure was 160/90, her pulse rate was 90 and regular. The main physical findings included normal eyegrounds, no enlargement of the thyroid gland, a normal sized heart with normal heart sounds, and diffuse abdominal tenderness. No other positive physical findings of any note were present.

Because of the patient's obvious illness, she was hospitalized. The following laboratory data were obtained: Her voided urine was loaded with white blood cells; there was no sugar; a trace of albumin was present; specific gravity was 1.011. A catheterized urine specimen showed only occasional pus cells. Sedimentation rate was 10 mm. in a half hour and 17 mm. in an hour. Fasting blood sugar was 106 mg. per cent and nonprotein nitrogen was 43 mg. per cent. Red blood count was 3,110,000, white blood count was 6,100, and hemoglobin was 9.45 grams (61 per cent). A differential count was normal. Total proteins were 9.2 grams with 6.8 grams albumin and 2.8 grams globulin. Cholesterol was 230 mg. per

cent. Chest x-ray showed normal heart and lung fields. An electrocardiogram was within normal limits. Blood thiocyanate level on September 13, 1956, was 19.5 mg. per cent. The patient's protein-bound iodine was reported as 7.2 gamma per cent.

The patient slowly but definitely improved and stated that her malaise was subsiding. Parenteral fluids were given for several days in an effort to hasten renal excretion of the thiocyanate. No other medications were administered. At the time of discharge, two days after admission, she still complained of visual and auditory difficulties and slight nausea, but it was felt that she could be sent home without further treatment since recovery would merely be a matter of further renal clearance of the thiocyanate. Her hemoglobin at discharge, September 15, 1956, was 10.40 grams.

She was seemingly doing well for a few days following hospital discharge, but she suddenly began experiencing increasing malaise and developing a high, spiking fever. She was readmitted to the hospital on September 24, 1956, at which time her temperature was 103.8 degrees, she was experiencing a shaking chill, and she appeared extremely pale as well as acutely and chronically ill. Her blood pressure was 130/90 and she complained of pain upon palpation of the left costovertebral angle, but otherwise there was no particular change from the previous physical examination.

Laboratory work at this time revealed a hemoglobin of 8.2 grams (53 per cent), white blood count of 5,600, red blood count of 2,600,000. The urine was loaded with pus cells and showed a 2 plus albumin. A urine culture showed *E. coli* which was moderately sensitive to tetracycline and chlortetracycline and highly sensitive to Furadantin and chloramphenicol. Nonprotein nitrogen was 45.5 mg. per cent. Stool was negative for occult blood. Blood thiocyanate level, done on September 25, 1956 (12 days after the original determination), was 9.1 mg. per cent.

A chest plate was again interpreted as within normal limits. Intravenous pyelograms were done and were reported by the radiologist as showing blunting of the calyces of the left kidney, whereas the right kidney appeared normal. The radiologist felt that this was consistent with pyelonephritis of the left kidney.

Her second hospital course was initially stormy. She was started on Chloromycetin 1.0 gram intramuscularly every 12 hours and was given parenteral fluids because of nausea and consequent inadequate oral fluid intake. Because of her anemia, felt to be related to thiocyanate intoxication, she was given two transfusions of whole blood. From her admission on September 24 until September 29 she continued to run a high fever with several temperature spikes each

day to 102 and 103 degrees, associated with shaking chills. However, she gradually began to improve. On September 29 her hemoglobin was 11.35 grams (74 per cent), and her urine showed an occasional pus cell and a trace of albumin, and on October 4, 1956, her blood thiocyanate level was reported as 0 mg. per cent. By October 5 she felt strong and well and stated that her hearing had returned to normal and that her vision was markedly improved. At this time her blood pressure was 160/90. Her urine was completely normal, whereas her blood count was 4,200,000 and hemoglobin was 13.2 grams. When seen at the office on two separate occasions, one week and three weeks after the second hospital discharge, she felt well and strong and had no particular complaints.

Pharmacology of the Thiocyanates

According to most authorities, the thiocyanate ion is not dissociated in the body into cyanide and, therefore, has no action in common with cyanide. These individuals feel that the cyanides are detoxified in the body to the stable and much less toxic thiocyanate. However, more recent work has been said to show an *in vivo* conversion of SCN to Cn, probably occurring as an enzymatic process within the erythrocyte, a reaction probably responsible for some of the toxic effects of the thiocyanates. Pharmacologically, the thiocyanate ion is said to have two major actions in the body, resembling both the iodides and the nitrites. Thus, they can produce the cutaneous and mucosal reactions considered typical of the iodides, including coryza and acne, as well as the smooth muscle relaxing properties of the nitrites. Supposedly, the latter ability is responsible for the use of the thiocyanates in hypertension.

Thiocyanates are readily absorbed from the intestinal tract, and the ion is distributed through the extracellular fluids in a manner similar to that of the chlorides and bromides. This ion is not altered in any manner in the body with tissue cells apparently being impermeable to it, and for this reason thiocyanates are used to estimate the volume of the body's interstitial fluids, the so-called thiocyanate space. The kidneys are the main route of thiocyanate excretion from the body, but the rate of excretion is extremely variable and unpredictable, a fact which leads to the main difficulty in their employment clinically.

Clinically, the thiocyanates have been used for the treatment of hypertension since 1903; they have no other medicinal indications. Quite early after the drug's introduction its toxicity was recognized and its use was quite limited until 1925, when it began enjoying a wide popularity which has not completely diminished even at present.

There is much disagreement in the literature as

to the thiocyanates' actual efficiency in lowering the blood pressure. Some authors maintain that any effect is very poor, whereas others claim a definite and predictable response in a fairly large percentage of cases. There seems to be general agreement among most observers that thiocyanates, aside from their debatable blood pressure lowering properties, are most definitely useful in the symptomatic relief of some side effects of hypertension, with abatement of hypertensive headaches being particularly prominent. It has been shown that intravenously administered thiocyanates are unusually effective in the rather rapid relief of the headache of high blood pressure when other methods have failed consistently.

Most experienced clinicians feel that when the drug is administered orally, a thiocyanate blood level of 8-12 mg. per cent must be reached before any appreciable effects are noted. These levels must be rigidly adhered to, as higher levels are almost invariably toxic and lower levels are generally ineffective.

Authors definitely agree that all patients receiving thiocyanates must be watched extremely closely for untoward effects. The only method of adequately controlling dosage is through frequently performed thiocyanate blood levels, since the maintenance dose needed to obtain hypotensive effects without toxic side reactions varies widely from patient to patient and from time to time in the same patient. Fortunately, the performing of thiocyanate blood levels is simply and easily done. During the time that this drug was more widely used, kits for this purpose were available through one of the large pharmaceutical houses. Thiocyanate determinations can be easily performed on most photoelectric calorimeters.

Toxic Effects of the Thiocyanates

Undoubtedly the most outstanding feature of the thiocyanates is their unusually broad spectrum of toxic side effects. Although it is widely believed that thiocyanate is not converted to cyanide in the body, there is now evidence to controvert this view, for it has been demonstrated that there is an *in vivo* conversion of thiocyanate to cyanide, probably as a result of an enzymatic process within the erythrocyte. Cyanide, of course, depresses cellular utilization of oxygen by inhibition of cytochrome oxidase, producing histotoxic anoxia, and it is quite probable that many toxic reactions to be described are due to this mechanism, particularly the central nervous system manifestations.

Innumerable reactions to thiocyanate are cited in the literature. Among the milder untoward symptoms that are often noted when blood thiocyanate levels are still in the so-called "therapeutic range" are lethargy, fatigue, cramping of the calf muscles, weak-

ness, signs of coryza, itching, nervousness, irritability, and various types of dermatitis, including some rather severe skin reactions. Various types of abdominal and gastrointestinal complaints have been recorded, including vomiting, diarrhea, epigastric pain, et cetera. Enlargement of the thyroid gland is quite apt to occur with prolonged ingestion of this drug, resulting in the so-called "thiocyanate goiter"; experimental studies have revealed that the thiocyanate radical is responsible for this effect of preventing the uptake of iodine by the thyroid gland.

Since reactions to thiocyanate are extremely common and are responsible for making these drugs therapeutically unacceptable in hypertension, unfortunately, some of these reactions have been demonstrated to occur with "safe" thiocyanate blood levels of 8-12 mg. per cent. The afore-mentioned symptoms can occur in a severe or exaggerated manner, such as fatal exfoliative dermatitis, explosive and exsanguinating bloody diarrhea, vascular collapse, and various types of confused states.

Psychotic reactions to thiocyanates are frequent and can pose rather difficult diagnostic problems; in fact they have often been confused with other psychoses as well as cerebral vascular diseases. It has been emphasized that thiocyanate levels should be included, along with bromide levels, as routine tests in any person with an obscure delirious or psychotic state. Anemia, sometimes of fairly profound degree, has occurred with thiocyanate poisoning. Auditory and visual hallucinations are mentioned in certain case reports, which is of interest since the patient in this discussion demonstrated such a finding. There are several reports of death attributed to chronic thiocyanate poisoning.

The foregoing long list of serious effects due to thiocyanate medication is an impressive one. The benefits of this substance are doubtful, to say the least, and, in view of recent advances in the pharmacotherapy of hypertension, it becomes increasingly evident that thiocyanates should be deleted from the physician's armamentarium. Yet this view has certainly not found universal acceptance, and thiocyanates are still in moderately wide use, often without true appreciation of their extreme dangers. The patient described in this paper was under constant medical supervision. Other physicians in this area stated that they employed potassium thiocyanate, felt it to be harmless, and did not determine blood levels.

A few words are necessary about treatment of thiocyanate poisoning. The main principle is to promote renal excretion of this material by employment of high fluid intake; parenteral fluids frequently must be administered because of nausea and other gastrointestinal symptoms. It would seem conceivable that

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Tracheo-Esophageal Fistula

Surgical Therapy for Nine Patients with Congenital Atresia of the Esophagus

JOHN G. SHELLITO, M.D., *Wichita*

We are indebted to Ladd and Swenson¹ for early recognition of tracheo-esophageal fistulae. The five types of general malformation were described well by Ladd¹ in 1944 (Figure 1). Ladd and Swenson² have discussed operative procedures for each. It was felt that the operation of primary anastomosis was the procedure of choice. In circumstances where the ends of the esophageal segments were so far apart that they could not be sewed together, a multiple stage procedure was advised.

Ladd and Swenson² reported a mortality rate of from 36 to 76 per cent. It is in an effort to add some slight reduction in this mortality rate, that we present this small series of cases (Figure 2).

Ladd and Swenson have presented simplified diagrams of the various types of tracheo-esophageal anomalies (Figure 1). In the main, one is concerned with the patient in whom an end to end anastomosis can be accomplished.

In 1951, Ferguson³ presented five cases in his published thesis to the American Laryngological Society, patients with tracheo-esophageal fistula not associated with a constriction or atresia of the esophagus. This adds a further type to those described by Ladd and Swenson, or perhaps should be included in their fifth category as demonstrated (Figure 1).

In 1954, Ware and Cross⁴ presented an additional case history and reviewed the literature on tracheo-esophageal fistulae without atresia or constriction of the esophagus. They were able to find 26 patients reported in the literature as having had this condition. Surgery was advised as the best method of cure.

Discussion

The surgical procedure possible in any congenital

Presented at a meeting of the Kansas Chapter, American College of Surgeons, Newton, September 16, 1956.

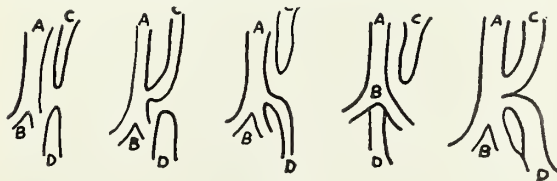


Figure 1

anomaly depends in large part upon the anomaly itself. Prior to a surgical procedure, even in these newly born, often premature children, it is possible to make a tentative diagnosis. Usually it is possible to tell whether or not there is any chance of success by the passage of a tube via the nasopharynx into the upper segment of the esophagus. Lipiodol or Urokon is the

Nine patients operated upon for congenital atresia of the esophagus and tracheo-esophageal fistula are discussed, with mention of one survivor, now 1½ years of age. Surgical delay, during which formula or gastric secretion may enter the lungs, is a common cause of death. Primary tracheotomy and gastrostomy are advocated.

liquid of choice, and not barium, for visualization by x-ray. The presence of air in the gastrointestinal tract betrays the connection of the lungs to the stomach. In such an instance, fortunately the most common one, it is logical to assume that an anastomosis can be accomplished.

In 1955, Battersby⁵ presented 90 cases of congenital lesions of the esophagus. Of these, 87 per cent were patients with esophageal atresia and tracheo-esophageal fistula. Thirteen per cent had other esophageal anomalies. A survival rate of 66 per cent was presented for a five-year period. We cannot say as much. The operative technique in the above series was gastrostomy and indwelling nasal-gastric string for dilatation purposes.

In a review of our own series it is seen that these children are often premature with a low birth weight. Only two of the nine children weighed over six pounds. A weight of around four pounds was usual.

All of the babies had pneumonia, either when operated upon or shortly thereafter. The time of surgery in relationship to the time of birth, therefore, becomes of prime importance. The child's chances of survival are decreased if a diligent pediatric nurse has

| | CASE | WT. LBS. | DAYS POST DELIVERY | SURGICAL PROCEDURE | LIVED PO (DAYS) | TRACHEOTOMY | GASTROSTOMY | CAUSE OF DEATH |
|---|--------|-------------|--------------------------|---|-----------------------|---------------|-------------|---|
| 1 | 30440 | 7 1/2 | 3 | Esophago- Esophagostomy (Elsewhere) | 0 | No | No | Pneumonia |
| 2 | 36242 | 4 1/2 | 1 1/2 | Esophago- Esophagostomy | 1 | No | No | Cardiac Failure Tetralogy of Fallot, Plus Coarctation Aorta and Patent Ductus |
| 3 | 30927 | 5 | 3 | Esophago- Esophagostomy | 4 | Yes - Late | No | Pneumonia |
| 4 | 47366 | 2 1/4 | 3 | No Upper Segment | 1/2 | No | No | Pneumonia |
| 5 | 72165 | 4 3/4 | 1 1/2 | Esophago- Esophagostomy | 1/4 | No | No | Pneumonia and Sub Dural Hemorrhage |
| 6 | 70144 | 4 | 2 | Ligature Fistula and Janeway Gastrostomy | 1 1/2 | No | No | Pneumonia |
| 7 | 101385 | 4 1/2 | 3 | Esophago- Esophagostomy | 1 1/2 | No | No | Pneumonia |
| 8 | 108060 | 6 | 3 | Esophago- Esophagostomy | 3 | No | No | Pneumonia |
| 9 | 111019 | 4 | 2 | Esophago- Esophagostomy | Alive | Yes | Yes | ---- |

Figure 2. Diagram showing the arrangement of the trachea and esophagus in the various types of esophageal atresia and tracheo-esophageal fistula. The letters refer to the following structures: A—trachea; B—bifurcation of trachea; C—upper segment of esophagus; D—lower segment of esophagus. (From New England Journal of Medicine 230:625-637, May 25, 1944.)

made consistent efforts to feed the child. The hope of survival lies in the establishment of the diagnosis as early as possible. In this way the lungs will not have to cope with so much formula.

An immediate tracheotomy will allow pediatric nurses to suck away excessive secretions incident to pneumonia. The survival of the child is in direct relationship to the severity of the pneumonia and the ability of the child and the physician to cope with it.

A gastrostomy enables feeding via the gastrostomy tube in the postoperative period. It also enables retrograde dilatation of the esophagus if this becomes necessary. In our patient, who is now 1 1/2 years old, this stricture is well treated by dilatation. Battersby⁵ cites an incidence of postoperative esophageal stricture of 66 per cent.

In the light of our uniformly bad results prior to the use of primary tracheotomy and gastrostomy, it

is felt that these latter two additional procedures account for the single success.

The Wichita Clinic
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PRESIDENT'S PAGE

DEAR DOCTOR:

The Committee on Medical Economics has always been one of our most productive committees. And much of the fruit of its labors has been borne in the field of insurance.


Society members have distinct and definite advantages under the plans developed by the committee for "group" purchase of coverage. The unique group life insurance plan now being presented was developed in detail by the committee itself following several years of study and research. The underwriting company was carefully selected from a number of sound reliable companies after thorough investigation.

The plan is based on a fixed premium of \$100 per year with the greatest coverage for the younger doctor, for example \$20,000 at age 25. Obviously coverage is less at older ages, but at all ages it offers more than can be purchased in any other insurance available to individuals. Furthermore, if 60 per cent of eligible members enroll, the underwriter will accept all impaired risks who are otherwise denied insurance because of physical disability.

But applications must be made during the present limited enrollment period. All our members and particularly the younger members, who in most instances carry grossly inadequate insurance protection for their families, are urged to file application at once. The executive secretary has full information in his office.

The committee also will present in the near future an improved disability plan for sickness and accident protection, offering broader coverage at lower costs. Details will soon be available.

Fraternally yours,

A handwritten signature in cursive script, reading "Darrell P. Nelson". The signature is fluid and elegant, with a large initial "D" and a long, sweeping underline.

President

EDITORIAL COMMENT

The Year in Review

Editor's Note. A picture of medicine in Kansas during the past year was presented to the House of Delegates last month by Dr. Clyde W. Miller, who retired as president of the Kansas Medical Society on May 7. Excerpts from his address are printed below.

Thanks to every physician in Kansas for making this year a most memorable one. To all of you who gave so much of your time, serving the profession in many ways, and who gave so generously and unselfishly financially—one cannot express his gratitude for such generosity.

This year has brought to me many experiences and mixed emotions, but truthfully I have enjoyed doing my part and carrying out your wishes and desires.

It has been impossible to visit each component society, and I sincerely hope that you all understand the reasons. To those societies that I did visit, thanks for the wonderful time and how nice it was to renew old acquaintances with all of you.

The past year has been an active one, and several major items were accomplished. Much traveling was done to various sections of the United States. It was a pleasure to attend the A.M.A. meeting in Chicago where I watched our own delegates work. They did a wonderful job there as we knew they would. One cannot emphasize enough the work that our delegates put forth at these meetings, and I feel that the House of Delegates should commend them for such outstanding work. The interim session at Seattle in November was most important since the Code of Ethics as submitted previously was to be discussed and decided upon. One of our delegates was chairman of the Reference Committee that handled this question and again displayed his abilities and leadership in handling this subject, which of course was the most important item of this session. His report as submitted was accepted without question, and I must add that this is an honor.

During the past two A.M.A. meetings the Council authorized the Kansas delegates sufficient funds to maintain a Kansas room for entertainment for our own members who attended as well as other delegates at the meeting. To me this is a great project and should be continued in the future, and I would so recommend.

Medicare came during this year with many hours of work and meetings both locally and nationally. Kansas was represented at all national meetings. I believe that our contract and fee schedules were good

ones, and I sincerely hope that this schedule has met with your approval. This program may not be what we want, but we would have been foolish not to have participated. This may lead to other programs in the future. In fact, it probably is the formula upon which other groups will attempt to obtain government paid health services, so we should be prepared in our thinking to decide if we want this expanded. If we do not, we should prepare now to prevent other groups from being included, and I so recommend.

Blue Shield was designated the fiscal agent for this Medicare Program. They are responsible for disseminating material such as fee schedules and for paying the prescribed fees. Unusual problems and fees will be solved by the Medicare Review Committee, which, I might add, has already held one session. Any decisions made by this committee must have final approval from the Army Department which is the administrator for the Defense Department.

During January, 1957, a special meeting was called at Chicago by the A.M.A. to discuss the polio immunization program. At that time every state was represented and advised to proceed on a state plan for immunization for all people 20 to 40 years of age. Thus, all ages from 6 months to 40 years would have the opportunity to receive the Salk vaccine. We were assured that ample vaccine was and would be available. Little was done about this procedure in Kansas, and possibly we are lucky since a severe shortage in vaccine developed in a short period of time. As you all know, at this time vaccine is only trickling into the state, and the demand is much more than the supply. More confusion exists, and this is not good for public opinion.

I feel that such a program should not be started until we are assured that the vaccine is ample to meet the demand. I feel that the doctors in our state could solve such problems if we are allotted the vaccine, thus keeping government control out of the picture.

I wish to recommend two things for your consideration:

1. That each component society set a maximum charge for polio immunizations and that each member be expected to set his fees in accordance with that figure.
2. That as a protest against the growing custom of mass immunizations at free clinics, which is not in accordance with good medical care, and because public and private agencies have failed to provide leadership in this program—the Kansas Medical Society should not endorse any group until such time as the polio immunization program is stabilized.

A special session of the House of Delegates was held at Wichita in October, 1956. The main objectives of this meeting were to decide on the Medicare

problem and to discuss the newly revised Medical Practice Act that was authorized at the May, 1956, meeting. The decision was unanimous to proceed with the effort of passing the bill in the oncoming meeting of the legislature in January.

Many meetings were held with the osteopathic profession and final agreement and understanding were reached. You know the results. We now have a new Practice Act with a composite board—five medical doctors, three osteopaths, and three chiropractors. We have a new Basic Science Bill which now requires all graduates to pass an examination before they are permitted to take any section of the composite board. There was a little change in the bill, and this was that no more than two members of the board of five should come from any one state school. This actually was better than we anticipated, since we were thinking of only one from any such school.

These bills, 281 and 282, will become effective July 1, 1957, and all previous licenses will expire June 30, 1957. May I say now that it will be most important that each of us register with the Medical Board of Registration before this date. It may save much controversial discussion in the future.

It is hoped that each one of our profession will be tolerant and patient. It will take many months to complete this integration, and the new Board will find many problems in implementing this bill. However, it will work. It must!

We believe that the majority of the membership of all professions want this to be successful, but some are suspicious of medicine and view our position with alarm. I, therefore, leave for your consideration several additional suggestions as follows:

1. We should let it be known publicly that the Kansas Medical Society intends to exert no influence whatever over the Board of Basic Science Examiners, either as to the appointment of its personnel or as to its activities, until or unless this board acts contrary to its legal responsibilities. Should that happen, we would as citizens take steps to correct the fault. Until then, the physicians of Kansas accept the presence of this board as another means of raising the standards of health care for this state, but have no interest whatever in its operations nor do we presume to control any phase of its activities.

2. Since our actions will be watched by political and professional persons who want to find an excuse for repealing the acts, I propose we conduct ourselves with exceptional care on every activity that can relate to this subject.

3. I propose that we most studiously avoid any attempt to compromise, that we comply with the prin-

ciples in which we believe, and that no branch of the healing arts be permitted to deviate materially therefrom. But I propose that we fight with equal vigor any effort to require anything of any other group that medicine is not willing to abide by also.

It has been a wonderful experience, and I hope that this year you too have obtained some of the same experiences. In spite of all this it will be a pleasure to turn over the gavel to Dr. Nelson. His leadership will produce a wonderful year, and his experiences to come, I am sure, will be as pleasurable as mine. As I retire may I thank you all for the honors bestowed upon me as president of the greatest medical society in these United States, and long may it reign in this leadership.

This Society has many active committees at work at all times, and there are new committees being formulated with specific programs for the ensuing year which, of course, will increase the financial strain on our budget. If we are to continue with our progress, it will be necessary to have more funds available for these projects. Likewise, it is now time to adjust or increase salaries. No organization can be effective without a progressive program which, of course, costs money.

With all the above in view, I believe that it would be wise to increase our state dues. The House of Delegates has previously approved maximum dues of \$50. The Council sets the dues, as you know, and at the present time the amount is \$40 per year. I would suggest that you strongly urge the Council to raise the dues to \$50 per year so that the program planned may be accomplished.

We are one of the few states charging less than this amount, and I must say we have done well with the funds that were available. However, it is now time to have such an increase to accomplish our desire in other fields. Our public relations is an important field that has been too long neglected and by all means needs more attention. This alone will require a good sum of money. This committee has many avenues to progress. It lacks only the funds to implement it. We must keep ourselves before the public. We must continue to give them information and knowledge that they desire and demand.

Clyde W. Miller, M.D.

The Year to Come

Editor's Note. The course of the Society during the coming year, as outlined by Dr. Barrett A. Nelson, president, was reported to the House of Delegates of the Society in the form printed below.

The new administration finds much of its work already laid out. So much important Society activity is already in high gear, asking only for guidance and a continuous flow of motive power.

The Medical Practice Act and Basic Science Law offer a challenge. They demand intelligent planning and purposeful energy to insure proper implementation and application of these measures. It is almost unbelievable that the proposed bills become law with only a minimum of alteration and amendment. Yet, there is much to be done before their ultimate purposes are achieved. There will be rough spots. There will be disturbing problems of adjustment and compromise. There will be entirely new policies and re-adjusted standards to be established, always remembering that every action is based on raising, as well as maintaining, high quality of medical care.

The Medicare program of medical care for dependents of those in the uniformed services was carefully planned and effectively inaugurated last year. Most interesting findings are being experienced. The growing burden of paper work in the physician's office has been greatly augmented by this program. There are fees in need of further adjustment. There are rulings to be clarified. Certainly in the regions affected there has been an appreciably increased patient load with the accompaniment of various problems.

Use of Salk anti-poliomyelitis vaccine, the most heavily publicized, most widely accepted public health measure of all time, will continue to offer problems of policy; problems of proper and effective distribution; effective methods of co-operation and ethical control of administration. Properly approached, there is here an outstanding instrument for wonderful improvement of public relations, a priceless opportunity to build for ourselves inestimable good will.

The Committee on Medical Economics is capitalizing on the broad experience of insurance programs in other states. It has already initiated an extended disability insurance program which will be of great interest and, they believe, widely accepted. Coverage will be greatly extended. There will be increased benefits at reduced costs, particularly for the younger men who will have reduced premium costs instead of paying equally with the older poorer risks. Furthermore, there will be a master policy under our complete control, and the company is to report periodically on plan experience with a view to increasing benefits or lowering rates where feasible. And this is with approval already obtained from the Kansas Commissioner of Insurance. The committee is continuing to explore possibilities for advantage in group purchase of life insurance, catastrophic insurance, and

medical-surgical coverage for our membership. As one doctor put it, "I'm tired of buying golf clubs and unneeded luggage for the doctor who treats my family. I want him adequately compensated by a good surgical and medical policy, so my wife won't feel like a nuisance and a charity patient."

Social Security!!! Exploration and debate are in order. Is it a great bargain the doctors are missing? Or is it actually far too expensive for what it offers, with no return at all for most of the doctors who would pay the compulsory tax? Or is it chiefly a premium paid for a return withheld from the man who wants to continue to offer his services and is likely not to live long enough to ever receive a return? Good meat for the teeth of a committee that can separate facts from propaganda.

Another very important program barely in full swing is that of the Safety Committee. We *must* make our influence felt to help stop the terrible toll of deaths and serious accidents on the highways, in traffic in the cities, with tractors and machinery on the farm, as well as the less recognized huge toll in the home, and especially the high accident death and injury rate for children.

Then there are the continuing effective works for cancer control, the excellent programs started for medical assistants, allied groups, maternal welfare, child welfare, school health, the American Medical Education Foundation badly in need of much more of our support, continued co-operation and encouragement for the outstanding accomplishments of the Woman's Auxiliary.

If the entire Society were to concentrate on only one project, it probably should be mental health. In no area is there greater vital need, need for better understanding of psychiatric problems on the part of our membership, need for closer liaison, mutual understanding and communication, with those who specialize in psychiatry, need for availability of psychiatric care, local mental health clinics widespread over the state, psychiatric beds in general hospitals, vastly more easily obtainable psychiatric treatment for children, education of the family physician so he may learn how to utilize for his patients the facilities now available, removal of the roadblocks to a proper commitment law, encouragement of the valiant efforts of the state and county mental health associations. And can someone solve the problem of obtaining competent psychiatric care for the great self-respecting middle class who want to pay their own way, who want something more than charity in the improved but still inadequate state institutions, but who cannot possibly meet the costs of care in the lavish private psychiatric hospital at such rates as

\$15,000 per year? In some cases for year after year after year? "Is a puzzlement."

There should be a much closer tie between the medical society and Kansas Physicians' Service, Blue Shield. Active interest, active participation in formulation of policy, expansion of services, closer understanding of the philosophy underlying *our* prepayment plan, greater comprehension of the tremendous worth of its present form, not to mention the enormous potentiality for further service to our patients in the ever present economic problems of illness. Here stands a most potent force for effective public relations.

Public relations have not had one-fourth of the attention urgently called for, press relations, county grievance committees, systematized 24-hour services, full use of radio and television, liaison with official agencies, liaison with the bar association, liaison with the hospital association, liaison with such local organizations as the Chamber of Commerce, PTA, school boards, civic organizations.

The Centennial Year, 1959, is just around the corner. With the promise of a vigorous, resourceful, efficient leadership, it should be a history making year. Meanwhile, there are huge tasks to be completed in preparation.

One segment should be busy studying and interpreting federal legislation for us. They should furnish regular reports and periodically prod our interest in what goes on. Maybe occasionally even a gentle prod toward concerted action of some sort. The weekly bulletins from the A.M.A. Washington Office should be perused and salient material mimeographed for interested committees, some of it for the county secretaries, some of it even for the entire membership (naively trusting them to read it). How many realize that three federal agencies are each spending the greater part of a billion dollars in their medical-health budgets for this fiscal year? Veterans Administration—825 million. Defense Department—790 million. Department of Health, Education and Welfare—772 million. Maybe somebody should keep in touch and ponder a bit. Actually, our Woman's Auxiliary is more familiar with federal legislation than we are.

Yes, indeed, a lot of chores. Summer is almost here, then autumn. That will be half the year gone. We had better buckle down and get started.

Barrett A. Nelson, M.D.

Basic Science Act

Among the bills passed during the 1957 session

of the Kansas legislature that are of significance to medicine is House Bill 281, the Basic Science Act. This will affect all future applicants for licenses to practice medicine and surgery, osteopathy, and chiropractic in this state. All essential parts of the act are printed below. Omissions are indicated and summarized.

"Be it enacted by the Legislature of the State of Kansas

"SECTION 1. Exceptions to Operation of This Act. Nothing in this act shall be interpreted to apply to any person who is licensed to practice the healing arts, or any branch thereof, in this state at the time this act shall take effect; nor to dentists, pharmacists, optometrists, nurses, barbers, cosmeticians, or Christian Scientists who practice within the limits of their respective callings; nor to persons specifically permitted by law to practice without licenses and who practice within the limits of the privileges given to them; nor to the sale, manufacture, or advertising of equipment, drugs, medicines, household remedies, and chemicals in the usual course of business as distinguished from the practice of the healing arts.

"SECTION 2. Qualification for Examination; Basic Sciences Defined; State Board. No person except as is specifically excepted herein, shall be permitted to take an examination for a license to practice the healing arts or any branch thereof, or be granted any such license, unless he has presented to the board or officer empowered to issue such a license as the applicant seeks, a certificate of proficiency in anatomy, physiology, chemistry, bacteriology and pathology (hereinafter referred to as the basic sciences) issued by the State Board of Basic Science Examiners (hereinafter referred to as the Board).

"SECTION 3. Healing Arts Defined. For the purposes of this act, the healing arts include any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, or injury and includes specifically but not by way of limitation the practice of medicine and surgery; the practice of osteopathy; and the practice of chiropractic.

"SECTION 4. Fees: Disposition of Moneys. . . ." The substance of Section 4 is that the examination fee is \$10 and a certificate from another state \$5.00.

"SECTION 5. State Board of Basic Science Examiners; Appointments; Terms; Expenses. The Governor, within 30 days after this act takes effect shall appoint a State Board of Basic Science Examiners consisting of five members, one to represent each of the five basic sciences. . . . Each member appointed

to the board shall hold a doctorate degree and at the time of his appointment be actively engaged within the field in which he will examine and shall be a member of the faculty of a state supported institution of higher learning in this state, of which no one school shall have over two members on the board. . . ."

"SECTION 6. *Examinations by State Board of Basic Science Examiners; Assistants; Compensation; Issuance of Certificates; Rules; Records.* The state board of basic science examiners shall conduct the examinations provided in this act. The board shall conduct such examinations at least twice a year at such times and places as it deems advisable. The board shall be empowered to issue basic science certificates to applicants who have complied with the provisions of this act, shall make such rules as it deems expedient to carry this act into effect and shall keep a record of all its proceedings which shall be prima facie evidence of all matters contained therein.

"SECTION 7. *Same; Examinations.* Every applicant, except as hereinafter provided, shall be examined to determine his knowledge, ability, and skill in the basic sciences. The examinations shall be conducted in writing, and the questions and answers shall be preserved by the board for a period of five years and the same shall be available for examination by the applicant or his attorney or the Healing Arts Board, or shall be available for production in a court of record in any action to which the board is a party. The examinations shall be conducted by number without knowledge by the examiners in the grading of examinations as to the names, professions or schools of applicants. If the applicant receives a credit of 75 per cent or more in each of the basic sciences, he shall be considered as having passed the examination. If the applicant receives less than 75 per cent in one subject and receives 75 or more in each of the remaining subjects, he shall be allowed a reexamination at the examination next ensuing, on application and the payment of the prescribed fee, and he shall be required to be reexamined only in the subject in which he received a rating less than 75 per cent. If the applicant receives less than 75 per cent in more than one subject, he shall not be reexamined unless he presents proof, satisfactory to the board, of additional study in the basic sciences sufficient to justify the reexamination.

"SECTION 8. *Qualifications of Certificants.* No basic science certificate shall be issued by the board unless the person applying for it submits evidence, satisfactory to the board, (1) that he is a person of good moral character; (2) that before he began the study of the healing arts he was graduated by a high school accredited by the state board of education of Kansas

or a school of similar grade, and (3) that he has a comprehensive knowledge of the basic sciences as shown by his passing the examination given by the board, as by this act required.

"SECTION 9. *Endorsement with Other States.* The board may in its discretion waive the examination required by Section 7, when proof satisfactory to the board is submitted showing (1) that the applicant has passed in another state an examination in the basic sciences before a board of examiners in the basic sciences; (2) that the requirements of that state are not less than those required by this act as a condition precedent to the issuance of a certificate.

"SECTION 10. *Void Certificates; Revocation or Cancellation.* Any basic science certificate and any license to practice the healing arts or any branch thereof, issued contrary to this act, is void. Any licensing board which has issued a license on the basis of a void basic science certificate shall revoke or cancel that license. The procedure for such revocation or cancellation shall be in accordance with the provisions of the act under which such license was issued.

"SECTION 11. *Penalties for Unlawful Acts. . . .*" This section provides for fines up to \$300 or six months imprisonment for fraud in connection with obtaining a Basic Science certification.

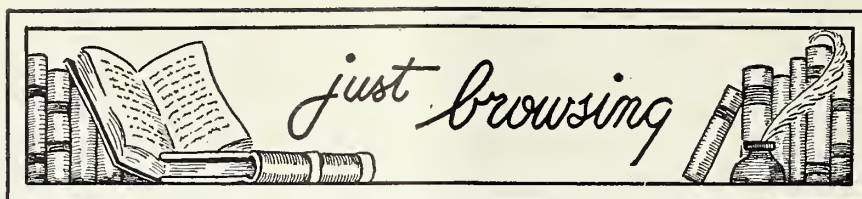
"SECTION 12. *Appeal.* Any applicant who fails the examination in basic sciences may appeal in writing to the district court for a review. Should the court find support in the grievance of the plaintiff, the board may reexamine the applicant in the basic science subjects and if successful, the applicant shall then be issued a certificate by the Board of Basic Science Examiners.

"SECTION 13. *Short Title.* This act may be cited as The Basic Science Act.

"SECTION 14. *Saving Clause.* Nothing in this act shall be construed as repealing any statutory provision in force at the time of its passage with reference to the requirements governing the issue of licenses to practice the healing arts or any branch thereof or as in any way lessening such requirements. But any board authorized to issue licenses to practice the healing arts or any branch thereof may in its discretion either accept basic science certificates issued by the board in lieu of examining the certificates in such sciences or it may also examine the holders of such certificates in such sciences.

"SECTION 15. *Repeals. . . .*" This section repeals all previous acts related to this subject.

"SECTION 16. *Effective Date.* This act shall take effect and be in force from and after July 1, 1957, and its publication in the statute book."



In 1877 W. Marrant Baker reported "On the Formation of Synovial Cysts in the Leg in Connection with Disease of the Knee Joint"—the condition to become known as "Baker's cyst." Eight cases were described in some detail, each having some established disease of the joint before development of the cyst. There was a careful evaluation of observed facts, an expressed theory of the means of production, and a warning against operative interference because of the danger of infection. His conclusions summarize the observations:

"1. That in cases of effusion into the knee-joint, and especially in those in which the primary disease is osteo-arthritis, the fluid secreted may find its way out of the joint, and form by distension of neighbouring parts a synovial cyst of large or small size.

"2. That the synovial cyst so produced may occupy (a) the popliteal space and upper part of the calf of the leg, or may (b) be evident in the calf of the leg only, projecting most, as a rule, on the inner aspect of the leg as a small defined swelling, not approaching within three or four inches of any part of the knee-joint.

"3. That however large the synovial cyst may be, fluctuation may not be communicable from it to the interior of the knee-joint; but the absence of such fluctuation must not be taken to contraindicate the existence of a connection between the joint and the cyst.

"4. That the synovial cyst may be expected to disappear after a longer or a shorter period, without leaving traces of its existence, even on dissection of the limb.

"5. That the cyst should not be punctured or otherwise subjected to operation, unless there appear strong reasons for so doing, inasmuch as interference may lead to acute inflammation and suppuration of the knee-joint.

"6. That most often the disease in the knee-joint will be found to have begun some time before the appearance of the secondary synovial

cyst; but sometimes the patient's attention may be first drawn to the latter, or the cyst may seem for a long period the more important part of the disease."

In 1885 he published a second paper, this time dealing with the same pathological process, but as he had observed it near the shoulder, elbow, wrist, hip, and ankle. The explanation offered for the formation of these synovial cysts was "... that the synovial fluid on reaching a certain amount of tension by accumulation within the joint, finds its way out in the direction of least resistance, either by the channel by which some normal bursa communicates with the joint, or, in the absence of any such channel, by forming first a hernia of the synovial membrane. In both cases, should the tension continue or increase, the fluid at length escapes from the sac, and its boundaries are then formed only by the muscles and other tissues between and amongst which it accumulates.

"... the caution given in the previous communication, not to interfere by operation with these synovial sacs without good reason, has been justified by increased experience."

The control of infection during operative procedures has, of course, completely changed our concept of the treatment of these lesions, and today they are, quite properly, excised when large enough to cause symptoms. Aside from this one change it is rather interesting to realize that we know little more about these lesions now than did Baker himself—in fact some which are at a distance from the joint are not recognized as Baker's cysts even though they do fit his original description, but are considered to be some new discovery. How many of our "new" discoveries were described many years ago? The old masters were careful observers and noticed many clinical facts which today we are apt to overlook, in our haste to get blood chemistry examinations and x-ray studies. Our own senses are still useful—if used.—O.R.C.

Tumor Conference

Neoplasia of the Lung in Women

Edited by PETER RASMUSSEN, M.D.

Dr. Stowell: In our concern that cancer of the lung is rapidly becoming the major tumor in men, we tend to neglect consideration of malignant and benign bronchial tumors in women. These two cases will illustrate some aspects of these problems. Dr. Delp, what is the history on this first patient?

Case I

Dr. Delp: This 37-year-old white woman's difficulty began with a cold a year ago, followed by pneumonia seven months ago. About five months ago she had severe pain in her right shoulder; this was not accentuated by respiration. She withstood the pain until one month ago, when, in addition, she began to get shortness of breath, swelling of her arms, and then rapid swelling of her neck and face. During hospitalization elsewhere, roentgenograms of the chest were taken and she had some intravenous medication which in a matter of five or six days improved her breathing and the swelling in her arms. She was then referred here. By this time the major portion of the swelling had disappeared, but over the chest she had a conspicuous network of dilated superficial veins. She has been a heavy smoker for 18 years.

Dr. Goertz: Roentgenograms of her chest from her previous hospitalization show a 2.5 x 2.5 cm. mass which extends laterally from the hilus of her right lung. There is a haziness on the right side, which obliterates the cardiac margin, indicating that the mass is anterior; and further, that it is present in the middle lobe. Our roentgenograms demonstrate a much smaller amount of opacity higher up on the right of the mediastinum. Fluoroscopically, she had paradoxical breathing caused presumably by a paralyzed right diaphragm. The x-ray diagnosis is primary bronchial neoplasm.

Dr. Delp: We felt, from the signs and symptoms described to us and the residual mass seen, that this patient had a classical superior vena cava syndrome. Our next problem was to decide upon the etiology

of the venous obstruction. No superficial lymph nodes were palpable; so she was bronchoscoped and subsequently had a thoracotomy.

Dr. Stowell: Dr. Proud, what did you see at bronchoscopy?

Dr. Proud: The carina was swollen and red. It was at least three to four times thicker than normal and instead of being in the customary 12:00 to 6:00 o'clock plane, it was rotated into the 10:00 to 4:00 o'clock plane. The right main stem bronchus, just inferior to the carina, showed compression from the anteromedial aspect into the lumen, so that it was impossible to pass a small bronchoscope beyond this point. Therefore, upper, middle, and lower lobe bronchi were not adequately examined. To determine the extent, type, and operability of the lesion, I made an attempt to biopsy it through the bronchial wall, but I was unable to do so. Because of this considerable bronchial compression and distortion, I thought the lesion was probably inoperable.

Dr. Delp: We felt that a histologic diagnosis was needed because this young woman is intelligent and has been apprised of the hopelessness of her situation even without definite diagnosis. Apart from this, however, was the possibility that something might be done at the time the diagnosis was established. For these reasons we advised thoracotomy.

Dr. Stowell: Dr. Allbritten, would you care to comment on what was seen during operation?

Dr. Allbritten: This is an interesting problem because of a relatively young lady with clinical findings compatible with bronchogenic carcinoma. Our surgical intent was that, in addition to diagnosis, perhaps palliative removal of tissues could be accomplished. However, at operation a solid, mediastinal mass which extended into the substance of the hilus of the right lung was found. The lower and upper lobes were inseparable in this area. There was total atelectasis of the middle lobe and all of the lower lobe except the lateral-basal segment, which still contained air. The air-bearing lung was composed almost entirely of over-expanded upper lobe. The phrenic nerve was involved by tumor, and tumor encased the superior vena cava and the azygos vein at its arch, so that there was no blood returned by way of the major azygos vein. This means that blood

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Rasmussen is a trainee of the National Cancer Institute.

had to return to the heart via the inferior vena cava, explaining the extensive collateral circulation over the chest wall.

Had we been able to ligate her right pulmonary artery, we might have given her some palliation from her dyspnea; however, this was impossible because it was solidly encased in tumor tissue. Only biopsy of the mediastinal mass was performed to establish diagnosis.

Dr. Helwig: The biopsy specimen is a mediastinal lymph node (Figure 1). There are small nests of cancer cells embedded in a desmoplastic stroma. It is an anaplastic squamous cell carcinoma, probably primary in the bronchus. However, I cannot completely rule out an adenocarcinoma of highly undifferentiated character.

Dr. Stowell: What is planned for this patient in the future?

Dr. Delp: The roentgenograms taken at her prior hospitalization show that the mass was considerably larger. This makes me think her medication, presumably nitrogen mustard, actually palliated her disease just prior to coming here. I suppose that this might lead us to think that a combination of radiation and nitrogen mustard might offer some palliation in the future.

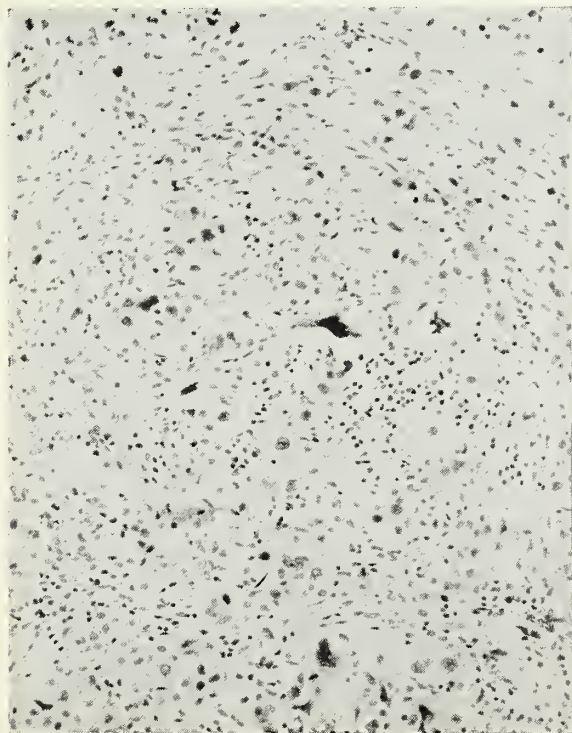


Figure 1. Photomicrograph of the mediastinal lymph node removed at thoracotomy in Case I. The anaplasia of tumor cells is evident. No normal lymph node is seen here. Hematoxylin and eosin stain, 125X.

Dr. Stowell: The case is unusual in that it involves a young woman, with probable anaplastic carcinoma of the lung.

Mr. Androes, please tell us about the next case.

Case II

Mr. Androes (medical student): This is the first admission for this 49-year-old white woman who was referred here because of productive cough of eight months' duration. She denies hemoptysis. She has lost 40 pounds in the past year. The important physical findings on admission were an area of dullness and absent breath sounds over the posterior thorax of the right side. She has positive histoplasmin and tuberculin skin tests.

Dr. Stowell: What do the roentgenograms of the chest show?

Dr. Gomm: There is an opacity in the base of the right lung which can be differentiated from the right heart border (Figure 2). This would indicate in the postero-anterior projection that this density is posterior. There is no hilar enlargement but there is depression of the interlobar fissure, and in the lateral projection the opacity is in the retrocardiac area. Radiologically, this means collapse of the right lower lobe and also possibly of the right middle lobe. We cannot make a definite radiological diagnosis.

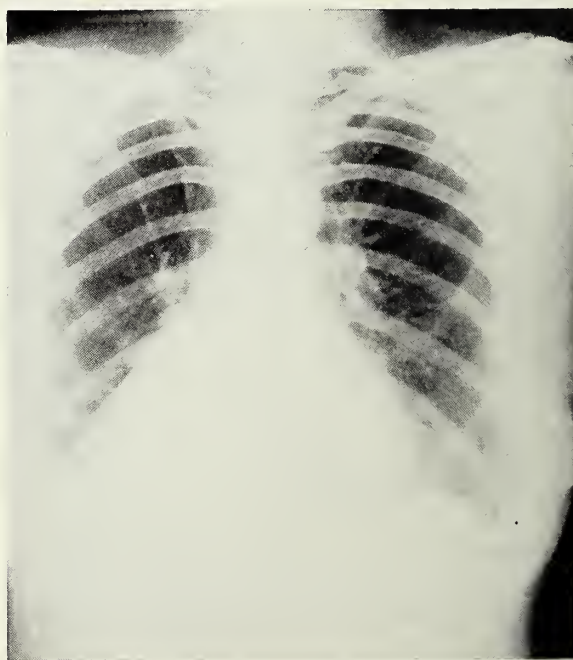


Figure 2. X-ray of the chest of the patient with bronchial adenoma. Note the atelectasis of the lower lobe of the right lung caused by obstruction of the corresponding bronchus.

Dr. Stowell: Dr. Bridwell, can you tell us the findings at bronchoscopy?

Dr. Bridwell: I saw a round, pinkish mass almost occluding the right main bronchus. It was pedunculated and appeared to be encapsulated; it did not appear to invade the bronchial wall. Biopsy was taken, attended by fairly brisk hemorrhage controlled by immediate suction.

Dr. Boley: The fragment of tissue obtained by biopsy is covered by metaplastic squamous epithelium which is thinned out, and beneath it is tumor with considerable hemorrhage in the submucosa. In areas where there is little trauma associated with the biopsy, we find that blood vessels are surrounded by tumor cells. At higher power, the cells are uniform and arranged in cords and nests. The diagnosis is bronchial adenoma, carcinoid type.

Dr. Stowell: Dr. Friesen, what did you do at operation?

Dr. Friesen: We removed the middle and lower lobes of the right lung, since the adenoma was obstructing the bronchi of these lobes. Postoperatively, she is doing well.

Dr. Boley: The surgical specimen does show gross "mushrooming" into adjacent parenchyma beneath the occluded bronchus. Microscopically, there is local invasion.

Dr. Friesen: It is uncommon to find a patient with a bronchial adenoma. We see perhaps two or three a year in this hospital. They are slightly more common in women than in men. In fact, with any obstruction to the bronchus in a female, if a foreign

body is ruled out, one should seriously consider an adenoma as well as a carcinoma; whereas, in a man, of course, the odds are in favor of carcinoma. The symptoms are usually those of hemoptysis, which differs from that in other pulmonary diseases. For example, with bronchiectasis, middle lobe syndrome, or carcinoma, the hemoptysis is mixed with purulent material and mucus; but in these patients it is usually described as a clear hemoptysis, that is pure blood, with little mucus or pus. Often adenomas of the bronchus will be "iceberg" tumors, that is with much more tumor mass spreading out beneath the bronchus into adjacent lung than is evident at bronchoscopy (Figure 3). Consequently, they cannot usually be removed bronchoscopically, because considerable tumor would be left in the patient's lung. This is not always the case, but this is frequent enough that I believe most physicians now are not advocating bronchoscopic removal of bronchial adenomas; it usually necessitates a lobectomy. A few patients have been operated upon where the bronchus has been opened, the tumor has been removed, and the lobe has been saved.¹

We are interested in this patient because her history is one of no hemoptysis, and, although she did bleed after her bronchoscopic biopsy it was not profuse and did not persist.

Dr. Bridwell: Bronchoscopically, by its pink color, I recognized this as an adenoma, since they are so vascular. Most carcinomas are white or grey.

Dr. Stowell: I have seen a few cases of adenomas in which one area was quite benign while malignant transformation was taking part in the base or in some other area; a few have metastasized.

Dr. Helwig: I want to reemphasize that in the days when chest surgery was not done regularly, adenomas were removed bronchoscopically. I know of three or four patients I followed over a period of years, and the growths all subsequently became true carcinoma of the lung. If you do not get the whole tumor, you certainly run the risk of subsequent malignant transformation.

Dr. Stowell: These two cases point up (1) the increasing occurrence of bronchogenic carcinoma in women in addition to men² and (2) the comparison of carcinoma to bronchial adenoma which is a more common lesion in women than men and much more successfully treated surgically than carcinoma.

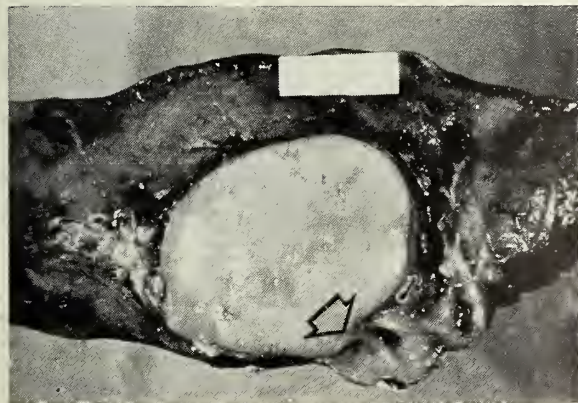


Figure 3. Gross photograph from another case of a bronchial adenoma. The specimen is an atelectatic lower lobe of lung. The origin of the tumor from the proximal portion of the lower lobe bronchus is indicated by the arrow. The main growth of the tumor is into the adjacent lung parenchyma. This is an "iceberg tumor."

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Boger, W. P.; Strickland, C. S.; and Gylfe, J. M.: Antibiot. Med. & Clin. Ther. 3:378 (Nov.) 1956.

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Annual Meeting

Reports of Officers Elected for the Society, Specialty Groups, and Affiliated Organizations

Listed below are the officers of the Kansas Medical Society elected by the House of Delegates at the annual session at Wichita on May 9. A complete report of the two meetings of the House of Delegates will be published later.

Brief résumés of meetings of other groups of interest to Society members are also included.

Officers for 1957-1958

President Dr. Barrett A. Nelson, Manhattan
President-Elect Dr. Thomas P. Butcher, Emporia
Immediate Past President .. Dr. Clyde W. Miller, Wichita
First Vice-President Dr. Glenn R. Peters, Kansas City
Second Vice-President
..... Dr. Frederick E. Wrightman, Sabetha
Constitutional Secretary
..... Dr. George E. Burket, Jr., Kingman
Treasurer Dr. John L. Lattimore, Topeka
A.M.A. Delegate, 1957-1958 .. Dr. Lucien R. Pyle, Topeka
A.M.A. Delegate, 1958-1959
..... Dr. George F. Gsell, Wichita
A.M.A. Alternate, 1957-1958
..... Dr. Norton L. Francis, Wichita
A.M.A. Alternate, 1958-1959 .. Dr. Cyril V. Black, Pratt
Chairman of Editorial Board . Dr. Orville R. Clark, Topeka

Councilors for 1957-1958

1. Dr. Emerson Yoder, Denton, term expiring in 1960
2. Dr. Joseph W. Manley, Kansas City, 1958
3. Dr. George R. Maser, Mission, 1960
4. Dr. Charles E. Vestle, Humboldt, 1958
5. Dr. Ralph G. Ball, Manhattan, 1960
6. Dr. James A. McClure, Topeka, 1959
7. Dr. Edward J. Ryan, Emporia, 1959
8. Dr. James E. Hill, Arkansas City, 1960
9. Dr. L. S. Nelson, Jr., Salina, 1960
10. Dr. Harold M. Glover, Newton, 1959
11. Dr. Norton L. Francis, Wichita, 1958
12. Dr. Albert C. Hatcher, Wellington, 1959
13. Dr. Lloyd W. Reynolds, Hays, 1958
14. Dr. Justin A. Blount, Larned, 1958
15. Dr. Lyle G. Glenn, Protection, 1958
16. Dr. James L. Jensen, Colby, 1959
17. Dr. H. Preston Palmer, Scott City, 1960.

Blue Shield

Dr. Francis T. Collins, Topeka, was re-elected president of Kansas Blue Shield at the annual meeting of the Board of Directors held at the Allis Hotel in Wichita, May 5.

Other officers are Dr. James B. Fisher, Wichita, first vice-president; Dr. E. Burke Scagnelli, Dodge City, secretary-treasurer, and Dr. Edward J. Ryan, Emporia, second vice-president. Dr. L. W. Reynolds, Hays, is past president of Blue Shield and will serve on the board's Executive Committee.

New members elected or re-elected to the board

this year are Dr. H. J. Brown, Winfield, District 8; Dr. James L. McGovern, Wellington, District 12; Dr. Robert K. Purves, Wichita, District 11; Dr. Floyd Smith, Colby, District 16, and Dr. A. E. Titus, Cottonwood Falls, District 7.

Other members of the board and the districts from which they were elected are Dr. E. T. Wulff, Atchison, District 1; Dr. P. E. Hiebert, Kansas City, District 2; Dr. Monti L. Belot, Lawrence, District 3; Dr. F. X. Lenski, Jr., Iola, District 4; Dr. Robert M. Carr, Junction City, District 5; Dr. Lucien R. Pyle, Topeka, District 6; Dr. H. S. Dreher, Sr., Salina, District 9; Dr. H. M. Glover, Newton, District 10; Dr. A. M. Cherner, Hays, District 13; Dr. S. T. Coughlin, Larned, District 14, and Dr. G. R. Hastings, Garden City, District 17.

Dr. Barrett A. Nelson, new president of the Kansas Medical Society, and Dr. Thomas P. Butcher, Emporia, the medical society's president-elect, are automatically members of the Blue Shield board by virtue of their offices.

Two lay members are appointed by the Governor of Kansas to the Blue Shield Board of Directors. Present appointees are John Junior Armstrong, Muscotah, and B. L. Humphreys, Hutchinson.

Other member representatives on the Blue Shield board are J. D. Smerchek, Manhattan; H. P. Reynolds, Moline; Russell Mosser, Lawrence, and Joe Reilly, Pittsburg.

Nominating Committee

Five past presidents of the Society form the committee which will nominate officers for the 1958-1959 year. Dr. Murray C. Eddy, Hays, will serve as chairman, and additional committee members are Dr. Conrad M. Barnes, Seneca; Dr. Clarence H. Benage, Pittsburg; Dr. Oscar W. Davidson, Kansas City, and Dr. L. S. Nelson, Sr., Salina.

Editorial Board

The Council of the Society, at a meeting held at Wichita on May 9, reappointed Dr. Orville R. Clark, Topeka, as chairman of the Editorial Board and editor of the JOURNAL. Serving with him on the Editorial Board, and the dates on which their terms will expire are: Dr. David E. Gray, 1960; Dr. Richard Greer, 1958; Dr. Dwight Lawson, 1960; Dr. John A. Segerson, 1959. All are Topeka physicians. Serv-

ing as associate editors are Dr. Donald P. Trees, Wichita, and Dr. Vernon E. Wilson, Kansas City.

Eye, Ear, Nose, and Throat Section

At a business session of members of the Eye, Ear, Nose, and Throat Section of the Kansas Medical Society, held in Wichita on May 7, it was decided that the 1958 meeting of the Society should include a one-day program on Tuesday with papers to be presented by eye, ear, nose, and throat specialists of Kansas. Dr. Max S. Lake, Salina, was named president of the group, Dr. Victor R. Moorman, Hutchinson, was elected vice-president, and Dr. Glen Floyd, Winfield, was chosen to serve as secretary.

Kansas Chapter, American Academy of General Practice

Dr. Bruce P. Meeker, Wichita, took office as president of the Kansas Chapter, American Academy of General Practice, at the close of the organization's annual meeting in Wichita on May 6. Other officers elected are: president-elect, Dr. Henry B. Sullivan,

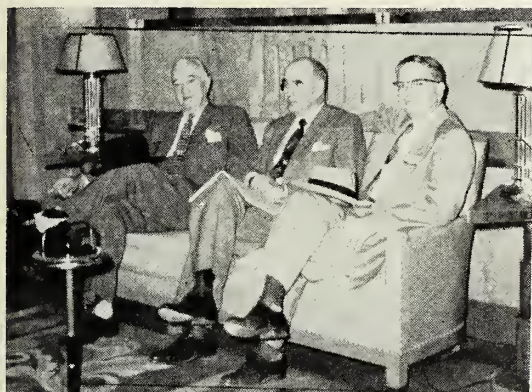
Shawnee; vice-president, Dr. Cloyce A. Newman, Topeka; secretary-treasurer, Dr. J. Allen Howell, Wellington; delegate to national meetings, Dr. Clyde W. Miller, Wichita; alternate, Dr. Lawrence E. Leigh, Overland Park.

Kansas Society of Anesthesiology

Dr. Dale U. Loyd, Wichita, was elected president of the Kansas Society of Anesthesiology at a meeting held at Wichita on May 7. Other officers are: vice-president, Dr. Harold F. Spencer, Emporia; secretary, Dr. William F. Powers, Wichita; treasurer, Dr. J. E. Gootee, Topeka; delegate to American Society of Anesthesiology, Dr. Paul H. Lorhan, Kansas City; alternate, Dr. Floyd C. Taggart, Topeka.

Kansas Obstetrical Society

Dr. Charles Don Shrader, Newton, took office as president of the Kansas Obstetrical Society at a meeting held in Wichita on May 7. Other officers are: Dr. Edward X. Crowley, Wichita, president-elect; Dr. Robert Sohlberg, Jr., McPherson, vice-president,



At upper left above, Dr. Frederick E. Wrightman, Sabetha, visits between sessions of the annual meeting with Dr. Haddon Peck, St. Francis, and Dr. Cecil C. Hunnicutt, Sabetha.

Pictured at right above is part of the crowd of more than 400 physicians and pharmacists who filled the ballroom at the Broadview Hotel for a dinner sponsored by the Kansas Medical Society Committee on Allied Groups.

Some of the officers of the Society are pictured above, at left, just before a meeting of the House of Delegates. Seated from left to right are: Dr. Thomas P. Butcher, Emporia; Dr. George E. Burket, Jr., Kingman; Dr. Barrett A. Nelson, Manhattan, and Dr. Clyde W. Miller, Wichita.

At lower right are some of the delegates and alternates who reported early Tuesday morning during the meeting for a breakfast preceding the first session of the House of Delegates.

and Dr. Henry M. Foster, Hays, secretary-treasurer. The immediate past president each year will represent the society at meetings of the House of Delegates of the Kansas Medical Society.

The organization will prepare case reports on selected maternal deaths for publication each month in the JOURNAL.

Kansas Orthopaedic Club

The following officers of the Kansas Orthopaedic Club were elected at a meeting held on May 7: president, Dr. Clarence L. Francisco, Kansas City; secretary-treasurer, Dr. Henry O. Marsh, Wichita. The group voted to contribute \$50 to the James B. Weaver Memorial Fund at the University of Kansas School of Medicine when the fund is established.

A scientific program was presented. Dr. Octavio Pliego, senior resident at St. Francis Hospital, Wichita, presented a report of a case of lymphoma of the spine with paraplegia and long term follow-up. Dr. Ward C. McClanahan, Wichita, described a patient with non-specific infection of the spine with recovery following extensive spinal fusion. Dr. John A. Grove, Newton, reported on a series of interesting fracture cases.

Kansas Society of Pathologists

A meeting of the Kansas Society of Pathologists was held at Wichita on May 7. Dr. Chauncey G. Bly, of the University of Kansas Medical Center, was elected president of the group, Dr. Richard F.

Looker of St. Francis Hospital, Wichita, was named vice-president, and Dr. William J. Reals of St. Joseph Hospital, Wichita, was chosen to serve as secretary-treasurer.

Kansas District Branch of American Psychiatric Association

Dr. Austin J. Adams took office as president of the Kansas District Branch of the American Psychiatric Association at a meeting of the group held at Wichita during the annual session of the Kansas Medical Society. He succeeded Dr. Thomas L. Foster, Halstead, who had served as president since last November when the branch of the national organization was formed to replace the Kansas Psychiatric Society. Dr. Frank H. Harris, Wichita, was elected secretary-treasurer. Serving as directors are Dr. Foster, Dr. Alfred P. Bay, Topeka; Dr. Paul E. Feldman, Topeka, and Dr. Howard V. Bair, Parsons.

During a scientific session at the Wichita meeting four round table discussions were presented.

The next meeting of the group will be held in November.

Kansas Urological Society

Dr. Oscar W. Davidson, Kansas City, was elected president of the Kansas Urological Society at a meeting held on May 7. Dr. Ronald W. Stitt, Kansas City, was named secretary-treasurer. Dr. H. F. O'Donnell, Wichita, will represent the organization on the Blue Shield Fee Schedule Committee.



Mr. Kirke W. Dale, Arkansas City, attorney for the Society, seated at left in the picture at the left, visits with Dr. Norton L. Francis, Wichita, also seated, Dr. Robert W. Myers of Newton, and Dr. John C. Mitchell and Dr. L. S. Nelson, Jr., of Salina.



Relaxing between scientific sessions at the Forum, in the picture above at the right, are Dr. Orville R. Clark, Topeka, at left, Dr. Murray C. Eddy, Hays, and Dr. A. L. Ashmore, Wichita.

Kansas Medical Assistants' Society

The 17th annual session of the Kansas Medical Assistants' Society was held at Wichita on May 4 and 5 with more than 300 members attending. Hope Finley, Hutchinson, took office as president of the organization for the coming year, and the following were elected to serve with her: president-elect, Edna Crosson, Lyons; vice-president, Ruth Sieverling, Wichita; secretary, Marjorie Slaymaker, Newton; treasurer, Virginia Brand, Lawrence; corresponding secretary, Mary Britain, Hutchinson.

Chosen to represent the Kansas society at the national meeting, to be held in San Francisco in October, are Hope Finley, Edna Crosson, Marjorie Slaymaker, and Pauline Keller of Topeka.

Woman's Auxiliary to Kansas Medical Society

Members of the Woman's Auxiliary to the Kansas Medical Society, in annual session at Wichita on May 8, accepted recommendations of their Nominating Committee in the selection of new officers. Mrs. Louis Cohen, who had served as president-elect during the past year, took office as president. Others elected are: president-elect, Mrs. R. T. Unruh, Kinsley; first vice-president, Mrs. Louis G. Graves, St. John; second vice-president, Mrs. Chester L. Young, Kansas City; third vice-president, Mrs. William K. Walker, Sedan; recording secretary, Mrs. Edward D. Greenwood, Topeka; treasurer, Mrs. William T. Braun, Pittsburg. A new office was created, that of fourth vice-president, and Mrs. Thomas P. Butcher, Emporia, was named to serve in that capacity.

Sports Events

One hundred twenty-one physicians played golf and 18 enjoyed competitive shooting at Wichita clubs on May 6 when the annual meeting of the Kansas Medical Golf and Trapshooting Association was

held. A tournament banquet, attended by 178 persons, was held that evening at the Crestview Country Club, followed by a short business session and the awarding of prizes contributed by friends of the medical profession.

Dr. Jack Coyle, Coffeyville, was named president of the organization. Dr. E. W. Mitts of Bonner Springs is golf vice-president, Dr. George Gill of Sterling is trap vice-president, and Dr. Fred Ford, Topeka, is secretary-treasurer.

Dr. E. E. Harvey and Dr. Fred Bosilevac tied for first place in the golf tournament. Other winners in the championship flight were: Doctors Millard Hall, A. W. Bradford, Ed Ashley, J. F. Coyle, E. S. Edgerton, H. O. Anderson, Jim Shaw, and H. P. Jones.

The winner of the first flight was Dr. George Gsell. Others who received prizes in that flight were: Doctors C. A. Isaac, W. D. Pitman, Jack Ashmore, W. T. Braun, L. E. Woodward, J. M. Stout, F. L. Ford, J. L. McGovern, and M. B. Knapp.

Dr. M. F. Frederick was winner in the second flight, followed by Doctors Stanley VanderVelde, F. E. Wrightman, E. W. Mitts, E. W. Christmann, J. S. Menaker, W. J. Kiser, T. T. Taylor, E. N. McCusker, and G. Q. Street.

In the third flight Dr. M. J. Cox was winner, and additional prizes were won by Doctors C. V. Minnick, W. G. Chappuaie, G. J. Millett, M. H. Hird, R. T. Parmley, L. S. Roberts, Robert Sohlberg, Glen Floyd, and J. E. Moseley.

The low score in the fourth flight was held by Dr. W. C. Goodpasture. Next in scoring were: Doctors G. F. Jordan, J. A. Blount, D. R. Wall, N. S. Smith, M. W. Sumner, G. L. Norris, F. Law, R. C. Tout, and Floyd Grillott.

Dr. J. H. McNickle was winner of the trapshoot. Dr. W. A. Smiley was second, followed by Dr. A. H. Baum, Dr. M. C. Eddy, and Dr. F. F. Nyberg.

First prize in the skeet shoot was won by Dr. G. L. Gill. Dr. E. S. Brinton and Dr. J. G. Phipps also received awards.

The prizes awarded were donated by the following: Quinton-Duffens Optical Company; Munns Med-



Pictured above is a section of the speakers' table at the annual banquet. From left to right are: Mrs. Clyde W. Miller, Wichita; Dr. and Mrs. Barrett A. Nelson, Manhattan, and Dr. Thomas P. Butcher, Emporia.



Medical assistants crowded the hall to hear Dr. Edward X. Crowley, Wichita, pictured in the foreground with Edna Crosson, Lyons, president of the Kansas Medical Assistants' Society.

ical Supply Company; Ciba Pharmaceutical Products, Inc.; Ethicon, Inc.; Goetze Niemer Company; Ames Company; Ortho Pharmaceuticals Corporation; Ross Laboratories; A. H. Robins Company; Abbott Laboratories; Upjohn Company; American Optical Company; Coe Surgical Supply Company; Hoffmann-La Roche; Archer Pharmacies; W. B. Saunders Company; Reed and Carnick; Eaton Laboratories; Carroll Dunham Smith Pharmacal Company; John C. Breck, Inc.; Wyeth, Inc.; Sandoz Pharmaceuticals; Smith, Kline and French Laboratories; Merck, Sharp and Dohme, Inc.; U. S. Vitamin Corporation; Armour Laboratories; Charles C Thomas, Publisher; Marcelle Cosmetics; White Laboratories; A. S. Aloe Company; Mead Johnson and Company; George Breon and Company; William P. Poythress and Company, Inc.; Burroughs Wellcome and Company; Mid-West Surgical Supply Company; Eli Lilly and Company; Schering Corporation.

Board of Health Appointments

Governor George Docking recently announced the appointment of four new members of the Kansas State Board of Health, Dr. Theodore E. Young, Winfield, and Dr. Richard O. Nelson, Lawrence, physicians; Dr. A. A. Herman, Hays, dentist, and Mr. Walter E. Fraese, pharmacist. Remaining on the board from previous appointments are Dr. L. E. Peckenschneider, Halstead, Dr. Ivan W. Cain, Kansas City, and Dr. Lyle G. Glenn, Protection, physicians; Dr. Fred B. Ogilvie, Kansas City, veterinarian, and Mr. D. C. Wesche, Manhattan, engineer.

Medical Services

(Continued from Page 364)

haps this is due to the increment of young physicians, graduating from the University of Kansas School of Medicine, who stay in the state to practice medicine. Since no attempt was made in this survey to study the quality of medical service, no association between age and quality of medical service can be shown.

The percentage of Kansas physicians designated as specialists is 40.5. These are predominantly in the large cities. Some attempt might be instituted to make their services, on a consultation or circuit basis, more widely available throughout the state.

The variation in distribution of physicians in Kansas is by no means a permanent one. The distribution is far from being static. Each month there is a considerable change in the location of physicians in the state, due to various factors already mentioned. However, it is expected that this survey will provide a base line or point of reference for future studies of

the distribution of physicians and their services in Kansas.

University of Kansas Medical Center
39th and Rainbow
Kansas City 12, Kansas

Intoxication with Thiocyanate

(Continued from Page 367)

use of cyanide antidotes, such as methylene blue and sodium thiosulfate, could be useful, but there are no reports of their employment for this purpose.

602 North Sixth Street
Garden City, Kansas

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Physicians contributed well over three million dollars to medical education in 1956. A report recently issued by the American Medical Education Foundation shows that 84,657 doctors gave \$3,320,152 to the country's 83 schools. This includes \$1,072,727 contributed directly to the medical schools.

A chronic disease or condition may be defined as one which lasts a long time or at least too long and which, while it is present, prevents the individual from operating at his optimum efficiency. The cause may be a disease, as in the case of poliomyelitis, tuberculosis or syphilis of the central nervous system. It may be a physical or mental injury or dysfunction as in the case of cerebral palsy, an accidental amputation, mental retardation, or excessive exposure to radiation.—Daniel Bergsma, M.D., *New Jersey Pub. Health News*, April, 1955.

Auxiliary Activities

Editor's Note. The following report of activities of the Woman's Auxiliary to the Kansas Medical Society was prepared by Mrs. William J. Biermann, Wichita, who served as president of the organization during the past year. The report was presented to the House of Delegates on May 7 and is being published here in accordance with a request of the House.

The Woman's Auxiliary to the Kansas Medical Society has completed its 32nd year. Inspired by the theme of the national president, "Health Is Our Greatest Heritage," and realizing the importance of continuity in program, earnest and intense efforts were made to continue the established objectives of the Auxiliary and to incorporate new ones as suggested by our parent organization. It is with a deep feeling of gratitude to the Board of Directors and to each Auxiliary member of Kansas that I present this report for the year.

American Medical Education Foundation. The importance of continued financial support of our medical schools was stressed throughout the year. A total of \$643 represents contributions received by April from 20 county auxiliaries, including Memorial and In Appreciation gifts. Nine auxiliaries responded to the president's request for a donation to the Foundation instead of giving her a corsage (the usual courtesy) when she visited each auxiliary. One large auxiliary, which yearly raises money for this project by a buffet supper dance, contributed \$640 directly to the University of Kansas due to inability to secure admissions tax exemption. Total contributions to medical education, April 1—\$1,283. At the annual meeting, A.M.E.F. corsages made by the chairman will be sold at the banquet.

Today's Health. The promotion of this excellent magazine continues to hold the spotlight in Auxiliary work. Only four auxiliaries do not have *Today's*

Health chairmen, and two of these are new auxiliaries in which learning to know each member took precedence over other objectives. PTA, church, and Scout groups helped to promote the sale in several counties. To stimulate interest among its members, one county had the chairman review an article from the magazine at each meeting. The *April Tips 'N Topics* showed Kansas in first place in Group II (membership from 1,001 to 2,000) in the contest with 224 per cent of its quota. Two county auxiliaries had over 500 per cent (Greenwood-Woodson County, 1,044 per cent); six auxiliaries over 200 per cent; and ten county groups had 100 per cent or more of their quota.

Films and Material from the A.M.A. "Put your Auxiliary on exhibit" was the theme of our Exhibits chairman, who encouraged each county to make use of exhibits, films, and other material available from the A.M.A. At the fall conference, the mechanical exhibit on home accidents was displayed; the film "Defense Against Invasion" was shown; and a catalog of motion picture films cleared for TV was distributed to all county presidents. One Auxiliary showed on TV the film "Danger at the Source" during Medical Education Week; and, at another time, the film, "Even for One."

National Bulletin. Because good public relations and accurate information go hand in hand, special emphasis was placed upon the value of the *Bulletin* for EVERY member of the Auxiliary. The state president distributed the pink *Bulletin* envelopes for expediency during her visits to county groups. We are pleased that our total number of subscriptions is 185, a substantial increase.

State Medical Association. The Auxiliary enjoys a friendly working relationship with the state medical society. Much help was given by individual members of the society, the executive secretary and his staff, and the Committee on Auxiliary. The state society pays for the printing and mailing of our monthly



Members of the Auxiliary, in the pictures above, enjoy a coffee break and an opportunity for visiting between business sessions in the auditorium of the Sedgwick County Medical Society building. In the center group, from left to right, are Mrs. Louis Cohen, Topeka, president; Mrs. William J. Biermann, immediate past president, and Mrs. Edward D. Greenwood, recording secretary.

publication, *Medical Auxiliary News*, and helps to defray expenses of our annual convention. This year, the society contributed \$100 for state prizes in the essay contest of the Association of American Physicians and Surgeons and sent a gift subscription of *Today's Health* to all state legislators.

Program. Following the approval of the Committee on Auxiliary, outlines for the year's work by the state officers and chairmen were distributed to the county presidents at the post-convention board meeting. Literature and material from national were distributed to county auxiliaries. During the summer, the year book was printed and mailed to each member. The fall conference, a two-day meeting, was well attended by state officers, chairmen, councilors, county presidents and presidents-elect, and past state presidents. The state president made 14 county auxiliary visits and attended five area meetings, which afforded her the opportunity to meet and talk with auxiliary members from 29 county groups and some members-at-large.

Public Relations. All component auxiliaries participated in some form of this endeavor. Guest day teas with educational programs on mental health, geriatrics, and other health topics for the wives of legislators, PTA groups, and county nurse Associations, and reciprocal meetings with wives of lawyers, pharmacists, and other groups continue to promote good medical relations. One county maintained a booth at a Home Show (a week's duration) where thousands of pamphlets pertaining to health, civil defense, mental health, safety, and *Today's Health* were distributed. Another had a cancer exhibit at a county fair. Speakers, health and safety films were provided for other organizations by some auxiliaries. The pamphlet "Winning Ways with Patients" was distributed to auxiliary members, doctors, dentists, hospital administrators, and their employees to promote better employee-patient relationship. Seven county auxiliaries participated in the AAPS Essay Contest. This project was successful in spite of great obstacles. A survey to determine the scholarships and loan funds available for student nurses in the state was made for the Kansas League of Nursing.

Community Service and Philanthropic Work. PR not only stands for public relations but for personal responsibility. A survey of the county reports shows that the individual assumed her responsibility in serving her community well and giving many hours of service to health organizations, such as the heart, cancer and tuberculosis associations, the March of Dimes, blood bank, etc. Incalculable volunteer hours were contributed to hospitals, hospital auxiliaries for sewing and other work, Girl Scouts, Community Planning Council, YWCA, Red Cross, Community

Chest, etc. Many members hold prominent positions in civic and philanthropic organizations.

Legislation. The state chairman, through a monthly article in our state publication, made an effort to inform the membership on proposed legislation affecting health and medicine with the hope that each one would be stimulated toward: (a) further study of the bills; (b) individual action in support or defeat of the bills on which she was informed. Each county president and legislative chairman was sent a letter explaining two important state bills, one pertaining to the five-point Legislative and Traffic Safety Program proposed by the Kansas Citizens Safety Council and the other concerning the Healing Arts Act and the Basic Science Act. County chairmen were urged to report on legislative activity at the monthly Auxiliary meetings. One county adopted a resolution on highway safety and sent a copy to each legislator and his wife. Many members are active in the League of Women Voters and hold prominent positions.

Publications and Publicity. The *Medical Auxiliary News* is a four-page monthly publication with the exception of the combined eight-page April-May issue. This issue includes the annual reports of officers, chairmen, and county presidents for permanent records of the year's achievements and progress. Copies of it are sent to all Auxiliary members, to a number of national officers and state presidents, to members of the Committee on Auxiliary, and Auxiliary editors of other states.

Organization. Our total membership was 1,191, including 142 members-at-large and 11 associate members on April 9. We have 33 component auxiliaries, ranging in size from five to 185 members; however, one Auxiliary voted to disband at the close of this year because the members are widely scattered over the county and the doctors no longer meet regularly. Our councilor districts were reorganized to conform with those of the Kansas Medical Society. We now have 17 districts.

Auxiliary Records. The scrapbook and records of the Auxiliary are kept by the chairman of Archives and History. They are filed at the office of the state medical society.

Nurse Recruitment. Nurse recruitment continued to progress with the organization of four new Future Nurses and Careers Clubs, making a total of 25 clubs with an approximate membership of 850. Twenty-two county auxiliaries actively participated in the recruitment program. Fourteen scholarships were given, totaling \$2,700, and approximately \$3,000 was loaned to student nurses by county auxiliaries. Through the Memorial Loan Fund of the state auxiliary, an additional \$500 was loaned to nursing

students. Three counties have members of Future Nurses Clubs working as "Candystripers" in local hospitals. Nurse recruitment teas, the showing of films to high school students, and assisting in a County Career Day were other phases of the program. Recruitment for allied medical services was emphasized, and several groups have already extended their programs. One county gave a scholarship of \$150 to a medical technician student; another gave two scholarships of \$100 each to students in an allied field; and a third Auxiliary gave assistance to two occupational therapists.

Mental Health. Mental Health activities were two-fold—education and service. The educational program was fostered through films, literature, talks, and visits to institutions. Two full mental health programs were developed by members of the Auxiliary through the assistance of the Kansas Division of Mental Hygiene. Twenty-five sets of the Mental Health Hygiene Library packets were given to city libraries. In areas where mental health associations and clinics have been established, the county auxiliaries worked closely with these agencies. Individual members gave volunteer service in mental institutions.

Civil Defense. A vital part of our program was to stimulate concern of the critical importance of preparedness in ANY emergency—natural disaster as well as war. Special emphasis was placed upon Home Preparedness—a First Aid Kit, the supplies of Grandma's Pantry, a flashlight and a portable radio—and individual participation in the community civil defense program. Thirteen auxiliaries have chairmen, and 21 counties participated in some phase of the program. Eleven had regular scheduled programs while the other groups stressed Home Preparedness; provided programs for such organizations as Farm Bureau and PTA groups, RN Study Clubs; distributed literature or worked with other civic organizations. However, the greatest contribution was through individual participation by taking first aid and home nursing courses; teaching such classes; and serving in the Ground Observer Corps. Two members of a small Auxiliary have each served 100 hours in the corps.

Home Safety and Accident Prevention. Each county president was placed on the mailing list for monthly safety literature from the State Highway Traffic Commission. Two counties had programs on safety and distributed literature; and a third group adopted a resolution on highway safety and sent a copy of the resolution to all state legislators and their wives. Individual members represent the Auxiliary on the Kansas Citizens Safety Council and the Governor's Traffic Safety Council of Women. One county member provided a speaker and a film on safety for four

civic groups in one day to make a long trip worthwhile for the speaker.

Doctor's Day was observed by many auxiliaries with social functions and gifts of red carnations to the doctors. During the convention, prizes totaling \$30 will be awarded for county exhibits on display.

We are happy to have Mrs. Frank Gastineau, third vice-president of the national Auxiliary, as our guest and guest speaker during this annual convention in Wichita. We look forward with pleasure to having Dr. Clyde Miller, president of the Kansas Medical Society; Dr. Barrett Nelson, president-elect; and the members of the Committee on Auxiliary as our luncheon guests on Wednesday, May 8.

All officers and state chairmen were asked to keep and submit an accurate expense account although they may exceed the budget. In the past, some Auxiliary members have found it necessary to use their own money to carry out effectively the various projects of the Auxiliary. It is hoped that accurate expense accounts will furnish necessary information for consideration of an increase in dues. The present state dues are \$1.00 per member, which provides a most limited budget—\$1,216 this year.

It has been a privilege to serve as president of the Woman's Auxiliary to the Kansas Medical Society. The members of the Kansas Auxiliary join me in expressing sincere gratitude and appreciation to Dr. Clyde Miller and members of the Kansas Medical Society for their guidance and assistance in our Auxiliary endeavors; and to Mr. Oliver Ebel and his staff and to Miss Pauline Farrell for their kindness and assistance throughout the year.

A gift of \$6,000 to furnish the multiple purpose room of the children's rehabilitation center now under construction at the University of Kansas Medical Center was presented recently by the Kansas City (Kansas) Junior League. The organization's president reported, when presenting a check to Dr. W. Clarke Wescoe, dean of the school, that the money had been earned through presentation of a show, the Junior League Follies.

Blue Cross members in 1956 received more than one billion dollars worth of hospital care—the largest amount yet paid in a single year in the history of hospital prepayment. The Blue Cross report indicates that 93 cents of each subscriber's dollar was returned in the form of hospital service benefits. Some 9,000,000 members admitted to hospitals last year received more than 53,000,000 patient days of care.

PHYSICIANS' ACTIVITIES

Dr. William C. Menninger, Topeka, has been selected by the U. S. Chamber of Commerce as "one of the great living Americans" because of his achievements in the advance of mental health.

At a meeting of the Mid-Central States Orthopedic Association held in Colorado Springs recently, **Dr. H. O. Marsh**, Wichita, was reelected secretary-treasurer.

A loan fund honoring the late **Dr. E. C. Pettersson**, Plainville, has been established at the University of Kansas School of Medicine with funds contributed by his friends since his death in January of 1956.

Dr. Andre Baude, Topeka, has been appointed to a three-year term on the board of the Kansas Tuberculosis and Health Association.

Kansas lost a physician recently when **Dr. A. R. Cuadrado**, who had been operating the Wallace County Clinic at Sharon Springs, gave up private practice to become chief of staff of the North Carolina Sanatorium at McCain, North Carolina.

Dr. Charles Pokorny, Halstead, Kansas governor for the American College of Chest Physicians, served as chairman of a scientific session of the college at a meeting in New York City early this month.

The Wallace County commissioners have appointed **Dr. William W. Carter**, Sharon Springs, health officer to succeed **Dr. A. R. Cuadrado**, resigned.

The late **Dr. Fred W. O'Donnell**, Junction City, who had a great interest in affairs at Fort Riley, has been honored at the military post. A new housing development on the post has been named O'Donnell Heights.

Dr. William Nice, Topeka, has been named to head the Hillcrest Outpatient Clinic in Topeka, according to an announcement made by **Dr. C. F. Taylor**, superintendent of the State Sanatorium for Tuberculosis at Norton. The Hillcrest facility will continue to operate as a division of the sanatorium. It has been converted from a 20-bed hospital to an outpatient clinic, in accordance with instructions of the Kansas legislature in its last session.

A Wichita physician, **Dr. Maurice M. Tinterow**, was one of the speakers at the annual convention of the Oklahoma State Medical Assistants' Society in Tulsa on May 5.

Dr. Delmond G. Buley, who has completed 50 years of service in the Sedgwick community, was guest of honor at a recent Sedgwick Chamber of Commerce meeting. The entertainment was in the form of a "This Is Your Life" presentation.

A new physician arrived in Anthony to begin practice this month, **Dr. J. M. Williams, Jr.**, who had practiced in Shreveport, Louisiana. Dr. Williams, a graduate of Temple University, had had a residency in obstetrics and gynecology there.

Dr. Galen M. Tice, of the University of Kansas Medical Center, was guest speaker at a meeting of the Douglas County Medical Assistants' Society at Lawrence on May 9.

Dedication services were held at the University of Kansas Medical Center recently for the Lerrigo Memorial Research Laboratory, honoring the late **Dr. Charles H. Lerrigo**, for many years executive secretary of the Kansas Tuberculosis and Health Association.

Dr. David R. Rice, who formerly practiced in Moundridge, has begun a residency in psychiatry at the Veterans Administration Hospital, Denver, and the Colorado University School of Medicine. **Dr. Willard Kaufman** will join the staff of the Mercy Clinic in Moundridge. Dr. Kaufman was graduated from the University of Kansas School of Medicine in 1953, served an internship at Wesley Hospital, Wichita, and then spent two years in Hebron, Jordan, under the sponsorship of the Mennonite Central Committee.

Dr. Monti L. Belot, Jr., Lawrence, was elected president of the nine-county Kaw Valley Heart Association at a meeting held in Fort Leavenworth last month.

A talk on "Our School System" was presented by **Dr. Eugene Myers**, Iola, at a recent meeting of the Allen County Medical Assistants' Society.

Week-ends are the most dangerous time to be on U. S. highways. In 1956, more than 56 per cent of all fatalities occurred on Fridays, Saturdays, and Sundays.

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Again the Jenkins-Keogh plan is up for consideration in Congress. While there is no assurance it will be passed, or even get out of the House Ways and Means Committee, many sponsors of the legislation this year are united in one organization and are making themselves felt on Capitol Hill.

Briefly, this bill would allow any self-employed person to put a limited portion of his income into a retirement fund without paying income taxes on the money. Taxes would be paid when the money was received as pension or retirement.

Sponsors of the Jenkins-Keogh plan point out that it very definitely is not legislation to give a special tax advantage to one group of people. For one thing, every self-employed person would be eligible, from farmers to doctors and from opera singers to architects. For another, corporations since 1942 have been allowed to put money into retirement funds for their employees without payment of federal taxes on the money; the self-employed merely want the same consideration.

At various times the American Medical Association has led in the campaign for enactment of legislation of this type. Two years ago the House Ways and Means Committee voted to report it out, as part of a broader tax bill, but the committee never actually got around to sending the combined bill to the House floor.

Now the lead is being taken by a newly-formed American Thrift Assembly, or officially the American Thrift Assembly for Ten Million Self-Employed. In addition to the A.M.A., the new group has the support of American Dental Association, American Bar Association, and a score or more of other national organizations that represent the self-employed.

After the Congressional session was well under way, the A.T.A. surveyed the political-legislative climate and found it favorable for Jenkins-Keogh. Then in early May the assembly asked its constituent associations to go to work. They were urged to have all members contact the House Ways and Means Committee with requests that the Jenkins-Keogh bill be reported favorably to the House floor. Assembly strategists are confident that if the committee hears

from enough of the people who would be affected, it will approve the bill before adjournment. Then, if there isn't time for House action this year, that step can come next year.

Economy has been the main obstacle in the path of Jenkins-Keogh—the fear on the part of the Treasury Department that passage of the bill would mean a serious loss of income tax revenue. However, the Treasury has never denied that the bill is justified to equalize tax status for the self-employed in relation to corporation employees.

Answering the economy argument, the Assembly makes two points:

First, the set aside funds, invested in the country's economy, would stimulate business and develop far more in new income tax payments than it would cost.

Second, because the self-employed who retain their health rarely retire at any arbitrary age, many of them in the years past 65 would remain in a tax bracket not significantly lower than when they paid into the retirement fund.

When Congress votes the money, the new home of the National Library of Medicine will be constructed at Bethesda, Maryland, near the National Institutes of Health and the Navy Medical Center. This site was selected by the board of regents at its second meeting.

The continuing national health survey is under way. Each month from now on, 140 Census Bureau interviewers will visit 3,000 homes, asking questions about illness and disability. On the basis of the data collected, the Public Health Service will publish national and regional reports on morbidity and mortality.

Because of widespread interest aroused by Senate hearings, there is considerable pressure for action before adjournment on legislation for some form of federal control over union welfare funds. One bill, by Senator Goldwater, would lay down strict procedures, including regular audits.

Also before Congress, but not making rapid progress, is a bill that would give the federal government control over amphetamines and barbiturates. Various types of bookkeeping and registration would be required, but physicians would be exempt from the requirements. It has administration support.

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THE KANSAS PRESS LOOKS AT MEDICINE

Doctor in the House

There are 82 medical schools in the United States. They produce about two-thirds the number of doctors the nation needs.

Fifteen years ago, these 82 schools had an operating cost of \$27 million a year. Today their cost is \$120 million a year.

It is estimated that about one-sixth of this amount comes from tuition. If an attempt were made to get any more from tuition, the result would be only to drive many qualified young men and women out of medicine.

The brutal fact is that most of the medical schools in wonderfully rich America are desperately poor, fighting a losing battle for solvency. This is as unreasonable as it is disgraceful.

For the medical school is no mere factory for doctors. It serves the public welfare in countless ways. Medical schools last year spent \$60 million for research—research which may eventually save your life or mine. They took care of two million needy persons who, admittedly served to some degree as raw materials for students, but who nevertheless did get aid.

There are few great fortunes left today, to be tapped for private grants for such things as medical schools. The schools need aid and the aid must be public. Were we to spend, as a whole people through our taxes, a fraction as much in the medical schools' fight against death and pain as we spend with Boeing to devise ways to deliver more and cheaper death, we could solve the problem.

But we resist federal aid to medical schools. We Americans, like the fearful alcoholic, fear that to take one nip is to become a drunkard. We're afraid that assistance to medical schools will result finally in socialized medicine.

I don't buy that. I believe we've enough smart doctors and smart politicians to devise a formula where we could aid the medical schools and still safeguard them.—*Hutchinson News-Herald*, April 25, 1957.

Drivers under 25 years of age were involved in more than 27 per cent of 1955's fatal accidents, reports the Travelers Insurance Companies. Such drivers comprise only about 14 per cent of the total of the nation's drivers.

Status of Communicable Diseases

Developments in medicine and public health, together with a high standard of living, have cut the communicable disease death rate in the United States by about 90 per cent since 1900, Health Information Foundation reports. Three disease groups, pneumonia and influenza, tuberculosis, and diarrhea and enteritis, which caused a third of all deaths in 1900, were responsible for only one-twentieth of all deaths last year.

Nevertheless, says the Foundation, these communicable diseases are still an important public health problem. The pneumonia-influenza group alone, for example, is currently the sixth leading cause of death, taking the lives of 45,000 Americans last year, more than the total number of fatalities in motor-vehicle accidents.

Out of 1,740,000,000 U. S. Savings Bonds issued so far, more than 800,000 have been reissued by the Treasury Department to replace lost, stolen, damaged, or destroyed bonds.

DEATH NOTICES

CHARLES SAMUEL ADAMS, M.D.

Dr. C. S. Adams, 81, an honorary member of the Stafford County Medical Society, died on April 21 at Larned, where he had been living with his daughter since his retirement several months ago. He had been in practice since 1903, having had an office first in Hudson and then in St. John. During World War I he was in military service, after which he served the U. S. Veterans Bureau before returning to his practice in St. John. He remained active until he suffered a heart attack last December.

JUSTUS ODELL WILLIAMS, M.D.

Death came to Dr. J. O. Williams, 77, at his home at Emporia on May 7 after an illness of several months. A graduate of the University Medical College of Kansas City in 1905, Dr. Williams first practiced in Emporia, leaving there during World War I to serve in the Army in New Orleans. He was a charter member of the American Legion post in Emporia and was an honorary member of the Lyon County Medical Society.



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Acute Pancreatitis

A Study of Its Etiology and a Review of the Literature

ROBERT E. DELPHIA, M.D., *Kansas City, Missouri*

Acute pancreatitis is a disease whose etiology has been highly debated since Fitz³⁵ description of 17 cases in 1889. In 1901 Opie⁶⁸ performed an autopsy on a patient who had acute pancreatitis in the presence of an impacted gallstone in the ampulla of Vater; he postulated that the pancreatitis was caused by retrograde flow of bile into the pancreatic ducts and their radicles.

A brief outline of pancreatic exocrine secretion is presented here as an aid to later discussion of acute pancreatitis. The secretions of the pancreas are under both hormonal and autonomic nerve control. In 1902 Bayliss and Starling⁹ found that parenteral injection of a hydrochloric acid extract of duodenal mucosa, or the introduction of HCl into the duodenum, caused pancreatic secretion in laboratory animals; they called this unknown substance secretin. Secretin causes the secretion of water and bicarbonate, leaving the enzymatic secretion essentially unchanged.^{38, 74}

A second hormone, pancreozymin, stimulates the secretion of digestive enzymes by the acinar cells.⁴⁰ Vagal stimulation produces a viscid secretion rich in enzymes.^{3, 35, 56} The chief proteolytic enzymes of the pancreas are trypsinogen and chymotrypsinogen, and these are activated by enterokinase from the small intestine. Minute amounts of trypsin act autocatalytically to activate both substances. The other important enzyme is lipase, which is activated by bile salts and some proteins. It is generally believed that fatty acids released by the enzymatic hydrolysis of neutral fat combine with calcium from blood and tissue fluid to form calcium soaps; this, in turn, leads to typical "fat necrosis."

Acute pancreatitis may vary in intensity from mild edema with minimal symptoms to a fulminating hemorrhagic necrosis with severe pain, shock, and death. It is felt^{28, 77} that the essential factor in the production of the disease is the escape of pancreatic secretions, rich in trypsin or trypsinogen, from the ducts or acini into the interstitial tissue where the trypsin can erode blood vessels. Recent experimental

studies on dogs⁷³ provide suggestive evidence that increased amounts of trypsin in the blood activate the trypsinogen in the pancreas, thus producing acute pancreatitis. They further suggest that the degree of edema or hemorrhage is proportional to the amount of trypsinogen retained in the pancreas as a result of obstruction of outflow of secretions. There are undoubtedly a number of ways by which this activation of pancreatic juice can be brought about.

Since the work of Opie⁶⁸ and Fitz,³⁵ numerous articles have been written in an attempt to explain the etiology of acute pancreatitis. It is the purpose of this paper to review and make an attempt at evaluation of most of the various possible etiological factors in this disease.

The Common Channel Theory

Long before the postulation of the common channel theory by Opie,⁶⁸ clinicians had noted a high frequency of chronic biliary tract disease in cases of acute pancreatitis; this relationship has been verified by subsequent clinical and experimental study. In a series of 1,278 cases of operated pancreatic necrosis, Schmeiden and Sebening⁷⁸ found that 894 (69.8 per cent) were associated with biliary tract disease. Ivy and Gibbs,⁴⁴ in reviewing the literature on acute pancreatitis, found that there was cholelithiasis in 55 per cent of 667 patients, acute cholecystitis in 18 per cent of 238 patients, and a normal gallbladder in 30 per cent of 125 patients. They also noted an 18 per cent incidence of acute pancreatitis in 163 patients with acute cholecystitis. More recent studies show an association of cholecystitis with acute pancreatitis in 31 to 33 per cent.^{12, 64, 67} Thus, most reports suggest that, in acute pancreatitis, cholecystitis is present in more than 30 per cent of the cases. In their review of literature, Ivy and Gibbs noted that an impacted stone was found to be the etiology of pancreatic disease in only 5 per cent of 2,004 cases. It has been suggested^{56, 88} that the cause of obstruction in patients with gallstones which are not obstructing the ampulla may be explained on the basis of easier susceptibility of the sphincter to spasm.

Obstruction of the Common Bile Duct

It was the work of Opie⁶⁸ which initiated and gave credence to the theory that bile in the pancreatic ducts

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Delphia is now serving his internship at St. Joseph Hospital, Kansas City, Missouri.



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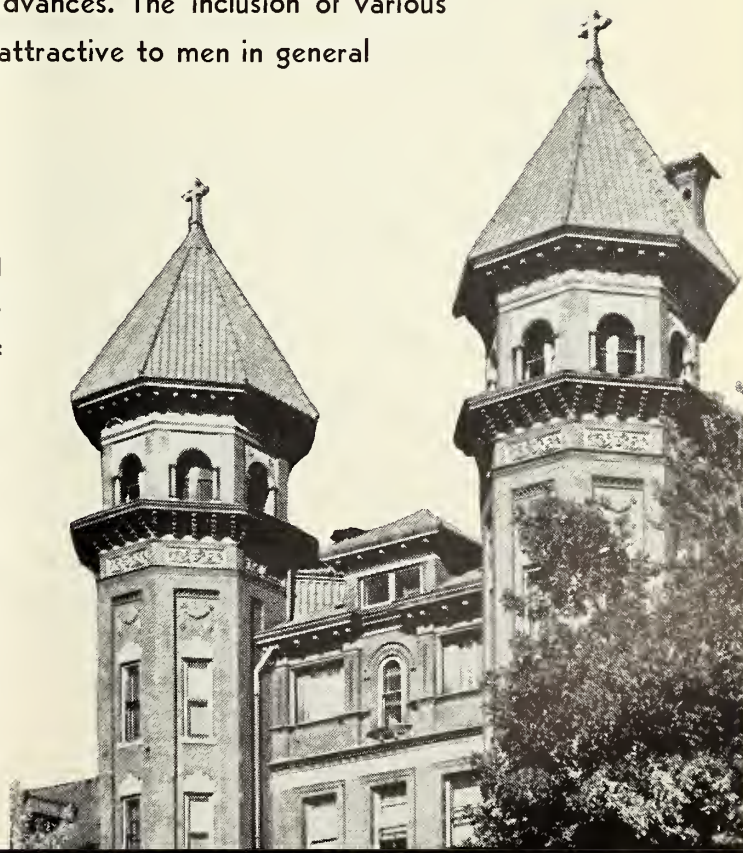
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4th ANNUAL CLINICS

AUGUST 1, 2 and 3, 1957

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could cause acute pancreatitis. In an autopsy study of 100 cases, Opie⁶⁹ found a common opening of the common duct and the duct of Wirsung in 89 specimens; but he concluded that the distance from the opening of the duct of Wirsung to that of the ampulla of Vater was sufficient to allow formation of a common channel by an impacted stone in only 30 per cent of cases.

Cameron and Noble,¹⁶ frequently quoted by those arguing in favor of the common channel theory, placed a small biliary calculus in the ampulla of Vater in 100 fresh autopsy specimens and injected colored fluid into the common duct. By this method they were able to demonstrate regurgitation of fluid into the duct of Wirsung in 66 per cent of the cases. This, however, completely neglects the concept that irritation or dilatation of the duct by a stone may cause contraction of the sphincter muscles of both the common and pancreatic duct in the living individual, thereby preventing reflux of bile into the pancreatic duct.

Ravdin and Johnson,⁷⁵ after reviewing several studies published prior to 1942, concluded that "There is anatomic possibility of formation of a common channel in 60 to 70 per cent of the cases, and there is direct evidence that this does occur in a considerable number of patients."

On the basis of 250 routine autopsies, Reinhoff and co-workers⁷⁶ concluded that a common channel could be formed in 17 per cent of the population. Mann and Giordano⁶² found the pancreatic duct and common bile ducts entering the duodenum by a common opening in 20 per cent of 200 routine autopsies; however, they concluded that in only 3.5 per cent would a common channel be a reasonable possibility. They concluded that an impacted stone would likely occlude the pancreatic duct in the other 16.5 per cent, thereby preventing the formation of a common channel.

Numerous successful attempts have been made at producing acute pancreatitis in laboratory animals by injecting bile from the animal's own gallbladder into occluded pancreatic ducts.^{4, 26, 43, 70, 71, 79} Rich and Duff⁷⁷ suggest that the large amount of bile which many investigators used, rather than the irritating effect of the bile itself, was responsible for the pancreatic necrosis which was produced. They injected 2 cc. of India ink into the ligated pancreatic ducts of dogs and found that even such small amounts of substance caused rupture of the small pancreatic ducts and led to extrusion of particles of ink into the pancreatic tissue. It must be borne in mind, then, that the fact that injection of bile into the ducts causes acute pancreatitis does not prove that it is the action of the bile itself. One must also consider the mechanical trauma of injecting bile at greater than

physiologic pressure and the fact that occlusion of the ducts may cause backing up of pancreatic secretions, with resultant mechanical damage from the increased pressure or the activation of the pancreatic juice by the bile.

In experiments in which adult animals were operated on in such fashion as to cause reflux of bile into the pancreatic ducts under physiological pressures, it was not possible to cause pancreatitis.^{62, 80, 84, 88, 93} Sensenig and Bowers⁸⁰ ligated the common bile duct of dogs, constructed a retrograde pancreatic enterostomy, and injected 6 to 10 cc. of the dogs' own bile into the pancreatic ducts. Whitrock and co-workers⁹³ ligated the common ducts of goats, removed a distal portion of the tail of the pancreas, and constructed a retrograde pancreatico-jejunostomy, so that all bile drained through the pancreatic ducts into the jejunum. Neither group found any evidence of pancreatitis in those animals whose retrograde drainage remained patent.

One of the reasons for the popularity of the theory that bile itself is responsible for acute pancreatitis is the fact that active trypsin is frequently found in normal pancreatic ducts;^{6, 20} however, it is known that calcium, bile, and tissue juice,⁴⁴ enterokinase,^{44, 77} and HCl⁵⁶ will activate trypsinogen.

Spasm of the Sphincter of Oddi

As early as 1919, Archibald⁵ produced typical hemorrhagic pancreatitis by the introduction of HCl into the duodenum of cats. He argued that, in the absence of stones, such elements as edema and spasm of the sphincter of Oddi could cause obstruction of the ampulla of Vater. Layne and Bergh⁵⁴ observed, in human surgery when the common duct was painfully distended, that contraction of the sphincter of Oddi continued 5 to 20 minutes after the relief of distention. Elman,³¹ in 1942, and Ravdin and Johnson,⁷⁵ in 1943, again suggested spasm of the sphincter as a possible etiologic factor in many cases of acute pancreatitis. Ravdin and Johnson injected solutions into the pancreatic ducts of cats in the presence of spasm of the sphincter of Oddi and found that the pressure required to break the spasm was frequently as high as 800 mm. of water, presumably far above the physiological level.

Spasm of the sphincter of Oddi has been demonstrated to be initiated by a host of agents and mechanisms. In man, spasm can be produced by painful distention of the common duct,^{24, 54} by acid in the duodenum,^{5, 24} by morphine injection,^{24, 73} by parasympathomimetic agents such as pilocarpine, mecholyl and urecholine,⁴⁵ by the pain of venapunctures, and by emotional disturbances.²⁵ Irritation of the colon of the dog often causes similar spasm.⁴⁵

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(1) Holt, J. O. S., Jr.: Dallas Med. J. 42:497, 1956. (2) Gelvin, E. P.; McGavack, T. H., and Kenigsberg, S.: Am. J. Digest. Dis. 1:155, 1956. (3) Natenshan, A. L.: Am. Pract. & Digest Treat. 7:1456, 1956.

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Ligation of the Pancreatic Duct

Ligation of the pancreatic duct in animals offers an excellent experimental means of simulating the effect of obstruction of the pancreatic duct or spasm of the sphincter of Oddi. This procedure alone produced focal inflammation, degeneration and atrophy of acini, plus fat necrosis in rats,¹¹ mild edematous pancreatitis in cats,⁵⁶ and mild interstitial edema with some polymorphonuclear infiltration in dogs.⁷³ Hemorrhage or necrosis, however, was not produced in any of these experiments.

Von Anrep³ noted an increase in size of the pancreas with subsequent increased rate of secretion when the vagus nerve was stimulated. Lium and Maddock⁵⁶ combined the two procedures (ligation of the duct and vagal stimulation) to produce acute pancreatitis in cats. Thistlewaite⁸⁸ produced elevated serum amylase levels in dogs by this same procedure. Acute pancreatitis was produced by pancreatic duct ligation and injection of pilocarpine in cats⁸⁹ and by combining duct ligation with the injection of secretin in dogs.⁷² Radakovich⁷⁴ showed that elevated serum amylase levels may be produced by ligating the pancreatic ducts and either injecting secretin or pancreozymin, or by feeding heavy meals. Werner⁹² produced acute pancreatitis in dogs by merely subjecting them to continuous intravenous drip of mecholyl.

In a well-controlled study,⁵⁶ the pancreatic ducts of some cats were ligated, while others of the group were left intact; all of them received either fatty meals, acetylcholine and eserine injection, pilocarpine injection, intravenous secretin, or vagal stimulation. In all cats in which the ducts were ligated, acute pancreatitis was produced. The most extensive and constant damage resulted in those animals which were fed two hours prior to ligation of the ducts.

It is obvious that spasm of the sphincter, obstruction of the ducts, or any other obstruction of the outflow of pancreatic juice is extremely important in producing pancreatitis, and the presence of bile in the ducts is not absolutely necessary for its production.

Traumatic Pancreatitis

It has long been recognized that abdominal surgery in which the pancreatic ducts were ligated would produce acute pancreatitis. Recently, it has been emphasized that this disease may follow almost any intra-abdominal trauma^{28, 59, 90, 91} and certain extra-abdominal trauma or surgery.¹⁹

In a series of 100 intra-abdominal operations, which included 20 subtotal gastrectomies and 30 biliary tract procedures, Mahaffey and Howard⁶¹ determined serum amylase levels preoperatively and, in most cases, 1, 24, 48, and 72 hours postoperatively. They found that the serum amylase level rose to 80 units in nine patients and to over 50 units in 27

patients (their normal: 15 to 40 units). In 31 operations consisting of thyroidectomies, thoracic procedures, amputations, and herniorrhaphies, no elevation of serum amylase was detected.

Millbourn⁶⁵ found that 10 per cent of 147 patients who had gastric resections developed elevated urinary diastase levels. In his series of eight fatal cases which went to autopsy, Dunphy²⁸ noted that ductal obstruction could be a factor in only four. He suggested that minor interference with blood supply was an important factor and that "sludging of the pancreatic secretions incidental to medication, dehydration, and other factors associated with surgical operations may be a contributing factor." Warren,⁹⁰ in reporting three cases of acute pancreatitis caused by external trauma, attributed the disease to minor contusion with slight hemorrhage and disruption of ductules, allowing escape of pancreatic secretion, digestion of devitalized tissues, and extensive necrosis.

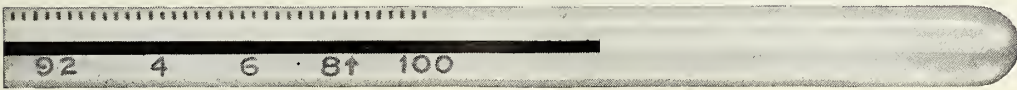
Recent work by Powers, Brown, and Stein⁷³ suggests another possible explanation of the pathogenesis of acute pancreatitis. These workers produced acute hemorrhagic pancreatitis and elevated serum trypsin levels in three dogs by the production of splenic infarction in the presence of ligated pancreatic ducts. They postulated that necrotic tissue releases trypsin which enters the blood stream and, in turn, activates trypsinogen in the pancreas.

No attempt is made here to tabulate all of the

TABLE I
AUTOPSY DIAGNOSIS OF ACUTE PANCREATITIS FOLLOWING ABDOMINAL SURGERY OR TRAUMA

| | Schmeiden & Sebenig ⁷⁸ | Warren ⁹⁰ | Coffey ¹⁹ | Dunphy, et al. ²⁸ | MacKenzie ⁵⁹ |
|--|-----------------------------------|----------------------|----------------------|------------------------------|-------------------------|
| Number of Cases | 140 | 4 | 4 | 8 | 7 |
| Gastric Surgery | 91 | 1 | — | 3 | 2 |
| Biliary Tract Surgery | 38 | 2 | — | 3 | 3 |
| Splenectomy | 7 | — | — | — | — |
| Pancreatic Biopsy | 4 | 1 | — | — | 1 |
| Abdominal Wound Penetrating Pancreas | — | — | 3 | — | — |
| Cesarean Section | — | — | — | 1 | — |
| Appendectomy | — | — | — | 1 | — |
| Femoral Embolectomy | — | — | — | — | 1 |
| Crushing Abdominal Trauma | — | — | 1 | — | — |

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Failure to recognize this limitation of enzyme tests may result in incorrect insulin dosage,² and may lead to diabetic complications.

(1) King, J. W., and Hainline, A., Jr.: Commercial Glucose Oxidase Preparations for the Detection of Glucose in Urine, *Cleveland Clin. Quart.* 23:212, 1956. (2) Leonards, J. R.: Evaluation of Enzyme Tests for Urinary Glucose, *J.A.M.A.* 163:260 (Jan. 26) 1957.

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cases of postoperative or traumatic pancreatitis that have been reported. Table I lists a few of the procedures and accidents which have been noted to be etiological factors. It would appear that any manipulation or abdominal trauma is hazardous insofar as normal function of the pancreas is concerned. It is also apparent that acute postoperative pancreatitis may result even when the pancreas has not been manipulated.

Other Causes of Obstruction

Carcinoma of the ampulla of Vater, of the head of the pancreas, or of adjacent organs may cause occlusion of the common channel, with resultant acute or chronic pancreatitis. Obstruction of the common duct by *Ascaris*,⁷⁸ by a distended loop of bowel,⁶³ and by edema of the ampulla of Vater⁷ have been suggested as rare causes of acute pancreatitis in human patients in whom no other factor could be found to explain the disease. Rich and Duff⁷⁷ noted small vesicles and epithelial proliferations in the pancreatic ducts of 18 per cent of 150 human autopsy cases. In 13 of 24 cases of acute pancreatitis in this series, the metaplastic epithelium was occluding the ducts and the ducts were dilated proximal to the areas of obstruction.

Cholangiography and the Reflux of Bile

Cholangiography has offered another means of studying physical behavior of fluid within the pancreatic and biliary duct systems. It has been shown,⁷⁵ when radiopaque substances are injected through a T-tube into the common duct, that there is a free flow of the mixture of dye and bile into the pancreatic duct in 20 per cent of cases. In a similar study, Mirizzi⁶⁶ concluded that there was an active flow or current which carried lipoidal and bile into the pancreatic ducts. At pressures not greater than 30 mm. of water,⁴² reflux of bile or dye into the pancreatic ducts of humans has been substantiated by the demonstration of opaque media in the pancreatic ducts and by an elevated serum amylase in 30 minutes from the time of introduction of the media.

In an intriguing study,⁴¹ 100 patients with cholelithiasis and choledocholithiasis were subjected to cholangiography. Thirteen of these patients had clearly demonstrated separate duodenal openings of the common duct and the duct of Wirsung; in all of them, the pancreatic duct was visualized by cholangiography. These authors postulate, in the 13 patients with separate openings, that the dye entered the duodenum via the common duct and regurgitated from the duodenum into the pancreatic ducts. It is conceivable that an aberrant duct between the two large ducts may have been overlooked in these cases.

Cholangiography has served to verify the fact that

a common channel can be formed. A recent review of literature⁴⁴ shows that the pancreatic duct was visualized by this method in 35 per cent of 1,431 patients; this closely parallels the figure of 30 per cent arrived at by Opie.⁶⁸

Evaluation of the Common Channel Theory

It has been shown that acute pancreatitis may occur in cases in which obstruction of the common duct could not be a factor in its etiology. Cases have been reported^{8, 22, 46, 81} in which focal pancreatitis occurred in areas drained by a patent duct of Santorini. There are reports, also, of acute pancreatitis in which the patent duct of Wirsung opened separately in the duodenum.^{22, 62, 77} Longmire⁵⁷ reported two cases in which acute pancreatitis occurred in an aberrant pancreas, one along the mesenteric border of the duodenum and the other in a Meckel's diverticulum.

It appears well established that: (1) Reflux of bile into the pancreatic ducts is a rather common occurrence; (2) Acute pancreatitis is a frequent complication of biliary tract obstruction; and (3) There is an increased frequency of acute pancreatitis in patients who have chronic gallbladder disease. There is, however, no direct evidence that the mere presence of bile in the pancreatic ducts is responsible for the production of acute pancreatitis.

From experimental and clinical evidence, it is probable that the factor of greatest importance is obstruction of the pancreatic ducts by such mechanisms as an impacted calculus, spasm of the sphincter of Oddi, edema of the duodenal mucosa, or trauma to the duct system. Assuming obstruction of the pancreatic ducts, serious pancreatic inflammation usually occurs only in the presence of an actively secreting gland.⁵⁶ The probable sequence of events is that the increased pressure ruptures small ductules allowing pancreatic juice to come into direct contact with blood vessels and the pancreatic tissue. Edema, vascular necrosis, or fat necrosis may result, and it is postulated⁵⁶ that the type and extent of tissue damage is commensurate with the volume and enzyme content of the pancreatic juice. Once pancreatic juice reaches the tissue spaces it begins to produce necrosis and inflammation. The main point to consider, then, is how the pancreatic juice reaches the tissues.

Metabolic Factors

Alcohol. There is undoubtedly an increased incidence of pancreatitis in acute or chronic alcoholism. It was pointed out by Ivy and Gibbs,⁴⁴ in a review of 357 autopsy cases of acute alcoholics, that 25 per cent had pancreatitis in some form. They noted also that the incidence of alcoholism in pancreatitis was approximately 20 per cent, whereas the incidence in

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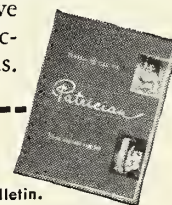
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The mechanism by which alcohol ingestion may lead to pancreatitis is still unknown. It has been suggested^{15, 30, 33} that it produces inflammatory reaction in the duodenum with edema of the papillae of the ducts. Stimulation of pancreatic secretion may occur⁶⁰ as a direct result of alcohol administration; however, experimental work with dogs^{15, 44} and an elevation of the therapeutic use of intravenous alcohol in humans²⁷ failed to demonstrate the production of acute pancreatitis.

Alcohol and large meals are frequently the precipitating factor in attacks of acute pancreatitis.³² Recent reports show that a history of acute alcoholism was obtained in 55 per cent of 108 patients,⁶⁷ 31 per cent of 78 patients,¹² and 34 per cent of 126 patients⁶⁴ with acute pancreatitis.

Methyl alcohol has been reported¹⁰ as a cause of acute pancreatitis. In this group of 300 cases, there were 17 fatalities, 13 of whom had acute pancreatitis.

Straus⁸³ cites a patient with chronic relapsing pancreatitis who could be counted on to take alcohol when released from the hospital. With each release, he would soon return with a new attack of pancreatitis. He postulated that the previous numerous attacks of pancreatitis had resulted in cicatricial stenosis of the duct system of such degree that each episode of acute alcoholism produced rupture of the proximal ducts and a fresh relapse.

High Fat-Low Protein Diet. Although perhaps of minor importance in acute pancreatitis, the postulation that dietary deficiency, a common phenomenon in alcoholics, may produce a chronic state of hyperlipemia is offered here as a possible etiological factor in the chronic forms of pancreatitis. The feeding of high fat-low protein diets over prolonged periods produced pancreatitis in rats³⁹ and in dogs.⁵⁵

In the latter study, 13 dogs were subjected to diets of this type and all developed fatty livers in 14 to 38 weeks. Eleven of these developed pancreatitis of moderate degree, similar to human chronic pancreatitis. Reports of elevated blood fat levels in human acute pancreatitis have been reported.^{19, 29, 36, 48, 49} Coffey¹⁹ reported five such cases, two of which were in patients with proved diabetes. It is apparent, then, that high fat-low protein diets will produce pancreatitis; however, the mechanism of production is not understood.

Experimental Studies with Ethionine. Recently, a new tool for experimental study of the function of the pancreas has been utilized. This substance, ethionine, is an analogue and antimetabolite of methionine, an essential amino acid. Intraperitoneal injection of ethionine^{34, 50} into fasting rats will produce acute pancreatitis; whereas, simultaneous injection of

methionine with ethionine will prevent the disease. DeAlmeida and Grossman²³ injected daily doses of 100 mg./kg. of body weight into dogs, cats, and monkeys. These animals were divided into three groups; i.e., they were either starved, well fed, or starved and given urecholine. All animals were sacrificed at varying intervals, and all of them showed acute pancreatitis at autopsy. Recent experiments with dogs^{47, 52, 74} have shown that acute pancreatitis is the almost constant result of oral or parenteral administration of ethionine. Only in instances where minute amounts of the drug were used did acute pancreatitis not result.⁵² In addition to acute pancreatitis, dogs fed ethionine developed yellow, fatty, friable livers which microscopically showed intense fatty infiltration.

Both the pancreas and pancreatic juice contain a protein substance which is a specific trypsin inhibitor.^{47, 53} In pancreatitis produced by feeding ethionine, the ratio of trypsin inhibitor to total protease is lowered in both the pancreatic tissue and the pancreatic secretions.³⁸ These findings suggest that the mechanisms of preventing activation of pancreatic juice are impaired in ethionine produced pancreatitis.

The experimental production of acute pancreatitis by the alteration of dietary intake provides another approach to the pathogenesis of this disease. Perhaps the frequent association of chronic alcoholism and acute pancreatitis may be partially explained on the basis of the dietary deficiency which is so often present in these patients.

Infection

Most authors agree that typical hemorrhagic pancreatitis may result from infection, but they also insist that such is a rare occurrence. In arguing against this route of spread, Wangenstein and co-workers⁸⁹ point out that acute pancreatitis is much less frequent in acute biliary tract infection than it is in chronic cholecystitis. Careful human anatomical dissection⁵¹ failed to reveal any lymphatic connection between the gallbladder and the pancreas. Hematogenous spread from an infected focus has been reported,^{30, 63} but such reports are extremely rare.

There are rather recent reports which tend to implicate *Clostridium perfringens* in the pathogenesis of some cases of this disease. It has been found, in dogs dying of acute pancreatitis,⁷⁰ that there was a marked increase in pancreatic bacteria, especially *Clostridium perfringens*. Tejerina-Fotheringham⁸⁵ identified this organism in the bile from the common bile ducts, in the urine, and in fragments of pancreas of patients with acute pancreatitis. He injected gallbladder bile⁸⁴ from a patient with acute pancreatitis into the pancreatic ducts of three dogs, producing acute pancreatitis in all three animals. Similar amounts of the same bile, autoclaved before injection, did not pro-



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duce pancreatitis in any of the three controls. He postulates that: (1) Acute pancreatitis is frequently the result of inflammatory reaction of the duodenal end of the common bile duct; (2) This inflammation reaches the site from the gallbladder; and (3) *Clostridium perfringens* is frequently the organism responsible for the chronic infection.

Mumps is occasionally complicated by mild edematous pancreatitis.⁴⁴ This was reported in 13 of 252 patients¹⁴ in whom the diagnosis was made on clinical grounds alone. In mumps, serum amylase values are frequently elevated, even when symptoms of acute pancreatitis are absent. In patients with parotitis, Applebaum⁴ found elevated serum amylase values in 84 per cent of 224 patients with mumps; however, only 12 per cent of this same group showed elevated serum lipase levels.

Acute pancreatitis, then, does occur as a complication of mumps. How frequent and how severe the disease is debatable because of the difficulty in interpreting elevated serum amylase levels, the mildness of the symptoms, and the rarity of fatalities. Elevated serum amylase and lipase levels have been noted also in infectious hepatitis.²¹

Impairment of Blood Supply

Experimentally, temporary occlusion of the gastroduodenal artery, when accompanied by obstruction of the pancreatic ducts, will lead to massive necrosis and hemorrhage into the pancreas of dogs.⁷² Ligation of the cysterna chyli (to obstruct lymph drainage), temporary ligation of the portal vein, or ligation of the pancreaticoduodenal artery, plus obstruction of the pancreatic ducts, failed to produce pancreatitis in others of the same group of dogs. Adams and Musselman,² however, report that acute hemorrhagic pancreatitis, similar to that seen in man, can almost routinely be produced by inducing thrombosis of the pancreatic veins of dogs.

Mercury, injected into the arteries supplying the pancreas,⁸² produced typical acute hemorrhagic pancreatitis in all of 21 dogs; and the degree of pancreatitis was not significantly altered by previous ligation of the pancreatic ducts or by administration of parasympathomimetic drugs. Injection of sterile paraffin into the superior pancreaticoduodenal artery of dogs produced typical acute hemorrhagic pancreatitis.⁵⁹ In the presence of ligated pancreatic ducts,⁷⁴ elevated serum amylase levels resulted from the injection of an oily emulsion into this artery.

Ischemia caused by arterial occlusion^{52, 58, 59} and obstruction of venous return⁸² are reported as the cause of death in a small percentage of human autopsy studies. It is probable that impairment of the blood supply is a factor in the etiology of acute

pancreatitis; however, it undoubtedly accounts for an insignificant number of cases.

Miscellaneous Etiological Factors

Pancreatitis was observed in three children who died of diabetic acidosis.⁴⁴ It has been reported in patients who ultimately died from trauma incident to electric shock.³⁷

Recent interesting and possibly significant studies on the etiology of acute hemorrhagic pancreatitis suggest that allergic phenomena may play a role in the production of this disease. It was observed by Thal and Brackney⁸⁷ that there was striking similarity between the vascular lesions of the dermal Schwartzman reaction and the lesion in acute hemorrhagic pancreatitis.

In an effort to evaluate the role of primary vascular sensitization, they perfused the pancreatic duct of rabbits with either *Meningococcus* or *Escherichia coli* toxin. The latter was a strain found in a routine human stool culture. Minute amounts of saline (.2 cc.) containing the bacterial toxins were injected into the ligated pancreatic ducts. Most of the animals were alert and eating well in 24 hours. At the end of this 24-hour period, the Schwartzman reaction was induced by the intravenous injection of 2 cc. of a 1:40 dilution of the same toxin. All rabbits were ill within three hours, and all died in from four to 24 hours after this injection. At autopsy, the only observation of note was severe diffuse hemorrhagic pancreatitis and disseminated areas of fat necrosis. In those controls in which either the sensitizing or the provocative dose was omitted, no gross or microscopic evidence of pancreatitis was noted at the end of 48 hours. By examining tissues, they noted close resemblance to human acute pancreatitis, both clinically and histologically. While it was evident that the lesion was vascular, they suggest that the fulminating destruction of the pancreas was enhanced by the action of trypsin and lipase liberated from the ischemic pancreas. These findings are of possible significance in relation to human acute pancreatitis by providing a mechanism whereby toxins or microscopic organisms present in the biliary or gastrointestinal tract may sensitize the pancreatic blood vessels.

Thal⁸⁶ recently reported the production of acute hemorrhagic pancreatitis by injection of foreign protein into rabbits previously sensitized to the protein. The animals were subjected to intravenous injection of a suspension of egg albumin; thereafter, intradermal injections were given at five-day intervals. This sensitization process was carried on for five to eight weeks until the intradermal injection of .5 cc. of the egg albumin resulted in gangrenous necrosis typical of the fully developed Arthus phenomenon. One week after the last intradermal injection, the same

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amount of standard albumin solution was injected into the ligated pancreatic ducts under controlled low pressure. Those animals which survived were sacrificed at the end of 48 hours.

At autopsy, seven of eight animals showed extensive miliary areas of fat necrosis and numerous large two- to eight-mm. areas where the normal finely reticular structure of the pancreas was transformed into a structureless swollen coagulum. Gross hemorrhage was visible in four of the eight animals. Capillaries and venules, in and about the areas of pancreatic necrosis, were occluded by hyalin thrombi. Control animals which were injected with autoclaved albumin showed only mild pancreatic edema. Those animals which were subjected to the intraductal injection of albumin at the time when intradermal injection produced only redness and swelling, developed less severe degrees of pancreatitis. Thus, the damage to pancreatic tissue was somewhat proportional to the degree of sensitization to protein which was injected into the pancreatic ducts.

It is unfortunate that Thal did not inject albumin into the pancreatic ducts of nonsensitized animals, for without such controls any results can be only suggestive. He concludes that the only inference which may be made is that small vessel thrombosis may be a precipitating mechanism in some cases of acute pancreatitis. These experiments do offer another line of approach in determining the etiology of acute pancreatitis.

Ackerman¹ reported a single case in which the cause of fatal acute pancreatitis was most likely transfusion with incompatible blood. Powers, Brown, and Stein⁷³ produced small foci of localized hemorrhage in the pancreas of dogs by injection of pure trypsin into the pancreatico-duodenal artery of dogs. When the pancreatic duct was ligated, the injection of the same amount of trypsin resulted in widespread hemorrhagic pancreatitis. This study suggests that obstruction of the ducts increased the amount of trypsinogen in the pancreas and that activation of this trypsinogen by trypsin resulted in extensive destruction of the parenchyma.

Summary

Experimental studies indicate that, when a common channel is established and outflow is obstructed, bile pigment is found in the pancreatic ducts and active trypsin is present in the gallbladder. In the presence of obstruction of the common duct, and even in the absence of such obstruction, cholangiographic studies in human subjects show a flow of radiopaque media into the pancreatic ducts. It seems apparent, however, that obstruction of outflow alone will not produce acute pancreatitis except in rare instances. Reflux of bile into, or the actual flow of

bile through the pancreatic ducts, under physiological pressures, may produce minute foci of infection but usually will not produce acute pancreatitis.

One of the reasons for the great popularity of the common channel theory was the knowledge that bile would activate trypsinogen or trypsin. Now there is good evidence that trypsinogen may be activated by pancreatic tissue juice, enterokinase, KCl, and calcium. Thus, trypsinogen activation is probably easily accomplished even in the absence of bile in the pancreatic ducts.

Experimentally, stimulation of pancreatic secretion in the presence of ligated pancreatic ducts will almost routinely produce acute pancreatitis; however, either procedure alone will usually result in no more than mild pancreatic edema or isolated focal lesions. It is likely, then, that any lesion or situation which results in obstruction of outflow of pancreatic juices in the presence of active secretion may lead to increased amounts of pancreatic enzymes in contact with pancreatic tissue. Activation of these enzymes would logically result in hemorrhagic pancreatitis. The actual mechanism of activation of these enzymes is unknown. Two of the most plausible postulations are: (1) Increased pressure within the duct system of the pancreas, causing rupture of the ductules with resultant release of trypsin into the pancreatic tissue; and (2) Trypsin is released into the blood stream.

One can list the possible causes of obstruction of outflow of pancreatic secretion, such as pancreatic calculi and spasm or obstruction of the sphincter of Oddi in those patients with a common channel. The etiology of spasm of the sphincter has been attributed to acid in the duodenum, parasympathomimetic agents including morphine, severe pain, and emotional strain. The sphincter may be obstructed by edema, inflammation, calculi, and neoplastic growths. There is considerable suggestive evidence that secretion of the pancreas is induced by vagal stimulation, injection of parasympathomimetic agents, injection of secretin, the feeding of heavy meals, and the ingestion of alcohol.

It is established that there is an increased incidence of acute pancreatitis in the presence of acute and chronic alcoholism. It has been suggested also that alcohol stimulates pancreatic secretion and that it stimulates acid secretion in the stomach. Acid chyme may precipitate spasm of the sphincter of Oddi. Whether this occurs in alcoholic patients is not known, but it remains as a distinct possibility. Gastro-duodenitis is also a reported result of alcoholism and a cause of spasm of the sphincter of Oddi. Thus, in one agent (alcohol), both prerequisites for acute pancreatitis are probably present; i.e., obstruction of outflow and stimulation of secretion.

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however, it is known that more than one-third of the cases of acute pancreatitis occur in the presence of cholecystitis. In addition, acute pancreatitis occurs more frequently with chronic than with acute cholecystitis. The works of one investigator suggest that *Clostridium perfringens* may gain access to the pancreatic tissue by way of the biliary flow, in instances of a common duct, and give rise to acute pancreatitis.

Experimentally, temporary or permanent interruption of blood supply to, or impairment of venous return from the pancreas has resulted in acute pancreatitis. Clinically, there are a few reports of autopsy studies in which this disease has been attributed to these factors. The work of Thal and Brackney, in which sensitization of pancreatic tissue to bacterial toxins and foreign proteins resulted in small vessel thrombosis, gives suggestive evidence as to the potentiality of the vascular factor in the etiology of this disease.

Experimental production of pancreatitis by the feeding of high fat-low protein diets and by the feeding of ethionine suggests that diet may be a factor in the production of acute pancreatitis. The observation that there is diminished trypsin inhibitor in pancreatic juice of ethionine-fed animals may ultimately prove to be significant. These studies provide the implication that, in an artificially-produced dietary deficiency (feeding ethionine, a direct antagonist of methionine), the defense mechanisms of the pancreas are compromised. If this occurs in the presence of methionine deficiency, it is likely that it may occur in high fat-low protein diets and in chronic alcoholism.

In the vast majority of cases of acute pancreatitis it is apparent that biliary tract disease and over-indulgence in alcohol are probably the etiological factors. It seems obvious, also, that there is probably a great variety of etiological factors in this disease. It would appear that the vascular and metabolic components of etiology deserve further investigation.

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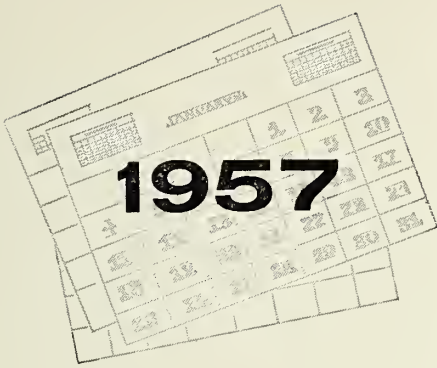
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Manuscript contest sponsored by Division of Obstetrics and Gynecology of United States Section, International College of Surgeons, deadline December 1, 1957. Details available from Dr. Harvey A. Gollin, 55 East Washington Street, Chicago 2, Illinois.

Fifth International Congress of Internal Medicine, Sheraton Hotel, Philadelphia, April 24-26, 1958. Write Edward R. Loveland, M.D., 4200 Pine Street, Philadelphia.

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BOOK REVIEWS

Medicine in Chicago, 1850-1950. By Thomas N. Bonner. Published by American History Research Center, Madison, Wisconsin. 302 pages. Price \$5.00.

This book should be of intense interest to all Chicago physicians and also those whose medical education has been secured in a Chicago background. Many physicians are interested in the history of medicine, and many historians are also interested, although they lack a purely medical interest, but are fascinated by the social and economic aspects.

This volume concerns many most striking and interesting personalities who dominated the early medical scene, and it also includes mention of the social history, economic development, medical societies, medical education, and hospital growth in a great American city.

Dr. Bonner is now engaged in writing the medical history of Kansas, having been selected by the Department of History of the University of Kansas. He is being aided by a grant from the Kansas Medical Society.

A large number of Kansas physicians will be rewarded by reading this history of Chicago medicine and will feel well repaid and entertained.—W.M.M.

General Urology. By Donald R. Smith, M.D. Published by Lange Medical Publications, Los Altos, California. 328 pages. Price \$4.50.

In his preface Dr. Smith states that the book is written primarily for the medical student and general practitioner. I agree that it would fulfill this function splendidly. However, it covers the field so well and contains so many simple practical basic, though oft forgotten, "gems" of physical diagnosis and management that it should be of interest to the specialist.

The book is remarkably free of padding and stereotyped antiquated concepts that mar some general texts. The illustrations are for the most part semi-diagrammatic, simple but effective, and easily grasped. The chapter on the neurogenic bladder is unusually good. In keeping with the times there is a chapter on psychosomatic urologic syndromes. It is of interest to note that the author is apparently not at all reluctant to refer resistant cases to the psychiatrist.

Appropos to the general aims of the text, surgical techniques are not discussed in any detail. The book stands the test of comparison with other texts in its field and in my opinion can be recommended without serious reservation.—W.M.

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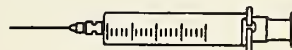


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Expectant Motherhood. By Nicholson J. Eastman, M.D. Published by Little, Brown and Company, Boston. 198 pages. Price \$1.75.

This has been a widely accepted little book for expectant parents for many years. It was first published in 1940. It is readable, complete without being complicated, and smoothly written to avoid controversy.

The present revision shows little change from the second. As might be expected, there are comments on "natural childbirth" and rooming-in. These are disposed of with the author's usual tact so that neither proponents nor opponents of either program can be offended. It is interesting that the previous edition had a dissertation on "hospital versus home delivery" whereas this edition confines the comments to the obvious advantages of the former.

This volume should rightfully continue its place as one of the most popular of the manuals for expectant parents.—D.E.G.

The Care of the Expectant Mother. By Josephine Barnes. Published by Philosophical Library, Inc., New York. 270 pages. Price \$7.50.

At the risk of endangering the reestablished brotherly love with England, we must express our doubt that this import will enjoy wide circulation in this country. This opinion is not based on any objection to the subject matter or lack of appreciation of the author's efforts but the inability to find a segment of the obstetrical group in need of this type of presentation. The publishers present it as "a practical guide for all who undertake the management of pregnancy." It is comparable to a nurses' textbook in most of its presentations. Certainly it could serve a physician only as a cursory review manual and seems to offer no threats to those already in publication in this country.

It does offer some interesting information on the function of the National Health Service Acts in relation to the obstetrician. Thus, we find that a fee of \$14.70 will be paid for the complete obstetrical service. No wonder they have revised their defense program if guided missiles come that cheap.—D.E.G.

ABSTRACTS FROM CURRENT LITERATURE

Heatstroke

Austin, Martin G., and Berry, John W.: *Observations on 100 Cases of Heatstroke*, J.A.M.A. 161:16, 1525-1529 (Aug. 18) 1956.

The diagnosis of heatstroke depends upon (1) an adequate exposure to high environmental temperatures, (2) hyperpyrexia, over 106 degrees F., (3) hot dry skin, and (4) central nervous system signs. In the heat victim the temperature is the evidence of the inability of the patient to dissipate heat. The absence of sweating seems to be the primary defect, the mechanism of which is not well understood. The authors have included patients with hot, dry skin who were acutely ill, although some of them did not have a body temperature as high as 106.

Of the 100 patients reported, 59 were males and 41 females. The ages varied from 26 to 88, with many over 60 years. Eighty-four per cent had some involvement of the cardiovascular system. Thirty per cent had excessive alcohol intake before the heat stroke. There were 17 deaths due to acute left ventricular failure in eight, anoxic nephroses in two, and deaths due primarily to the heat syndrome in seven.

Treatment requires provision of adequate tissue oxygenation by the treatment of shock, balance of electrolytes and fluids, prevention of bacterial complications, and treatment of an underlying disease process. Patients were given ice baths until the rectal temperature was 102 degree. Brisk massage and nasal oxygen were given during the baths. Those patients with systolic blood pressures below 100 mm. Hg. were given Levophed. Not over 3000 c.c. of fluid was given daily. Fluids were mostly five per cent glucose in saline. In a few patients in shock, cortisone was administered. All comatose patients received penicillin prophylactically.—D.R.D.

Submucosal Rectal Nodules

Swartzlander, Frank C.; Jackman, Raymond J., and Dockerty, Malcolm B.: *Submucosal Rectal Nodules*, Am. Jnl. Surg. (Nov.) 1956.

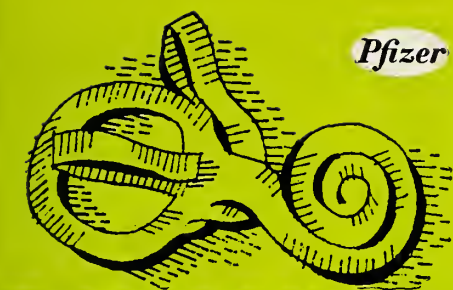
This is a presentation of a series of 91 cases of submucosal rectal nodules from Mayo Clinic over a seven-year period from 1945 to 1951. Also included is a short review of the literature.

The most commonly occurring nodule was hypertrophied lymphoid tissue in 28 cases. No evidence of generalized lymphoid disease was present in these cases. Follow-up studies revealed no evidence of this lesion being pre-malignant.

Oleomas were the second most common lesion in this series (20 cases). It is generally felt that these occur as the result of injection or instillation of some type of oil. These lesions also are not believed to be pre-malignant.

Carcinoids were found in 16 patients and were

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considered malignant. It is believed these tumors arise from the chromaffin system of the intestinal mucosa. No reports are available that these tumors give the "carcinoid syndrome," which has recently been described with carcinoids of the small intestine. Also these tumors of the rectum do not reduce silver salts as do other carcinoids.

Inflammatory lesions were present in 11 cases. Pathologic examination of these lesions revealed acute or chronic inflammatory changes in the rectal mucosa.

Leiomyomas were present in five patients and all were benign.

Other lesions included in the series were one leiomyosarcoma, one adenocarcinoma, grade 1, one lipoma, two phleboliths, four indefinite cystic lesions, and two granulomas.

Submucosal nodules of the rectum are not uncommon and in this series most commonly occurred on the anterior rectal wall, between the dentate line and a point 9 cm. above the dentate line.

The size of the nodules may vary from 3 mm. to 4 cm., the average size being 1-2 cm.

Most of the submucosal rectal nodules of this series (80.3 per cent) were benign, but all should be biopsied. Benign nodules may be excised; if cystic, incision and drainage will suffice. It is felt that carcinoids may be locally excised with fulguration of the base if they are no larger than 1 cm. Larger growths should be treated more radically. Radical treatment is recommended for leiomyosarcoma.—*R.P.S.*

Breast Cancer and Pregnancy

White, Thomas Taylor, and White, William Crawford: Breast Cancer and Pregnancy, Ann. Surg. 144, 384-393 (Sept.) 1956.

The authors state that breast cancer and pregnancy coexist more frequently than is generally believed. About one of every 35 patients with breast cancer, or one of every three during the childbearing age, will have pregnancy as a complication.

The report is made on 49 cases followed for five years. A statistical analysis is made of the cases after being classified into various phases of pregnancy.

Of 11 patients treated primarily during pregnancy, two of four patients with disease limited to the breast survived 14 years. All cases with involved axillary nodes died within four years.

Of 14 patients with disease found during pregnancy and treated during nursing, one of three with disease localized to the breast survived 7½ years.

All of the 11 with axillary spread were dead in five years.

Of 12 cases treated during nursing when disease had been found during nursing, three of five with disease limited to breast survived five years. Two of seven cases with axillary spread lived five years.

Of 12 cases operated upon for breast cancer who later became pregnant, seven of eight with disease limited to the breast survived five years.

The authors concluded that patients treated during pregnancy or nursing without spread of the disease beyond the breast, have a prognosis similar to an uncomplicated series. Also, it was felt that patients who became pregnant after operation have a good prognosis. Performing an abortion on patients with cancer of the breast appears to have no influence on the course of the disease.

General Practice Definition

A new definition of general practice, requested by three different committees of the American Medical Association, was formulated at the annual meeting of the American Academy of General Practice held in St. Louis last month. The definition reads as follows:

"General practice is that area of medical care performed by a doctor of medicine in those fields of diagnosis and therapy commensurate with his professional competence, assuming a total continuing responsibility for the health of the individual or the family as a unit."

Standards for membership in the organization were tightened by adoption of an amendment requiring a one-year rotating internship as an absolute minimum requirement.

Film, "Medicine and the Law"

The second film in the American Medical Association-American Bar Association series on "Medicine and the Law" will be available through the A.M.A. Film Library after July 1. It was shown for the first time on June 5 at the A.M.A. convention in New York.

The 30-minute black and white sound film deals with prevention of professional liability action. It presents four case reports of situations which caused legal action against physicians. It is a companion film to "The Medical Witness" in the series produced by the William S. Merrell Company in cooperation with the medical and legal organizations.

Medical societies are urged to arrange advance bookings for the films.

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Diabetic Film Available

The film "Urine Sugar Analysis for Diabetics," developed in cooperation with the medical profession, is available at no charge to the medical and allied professions through Ames Company, Inc.

The film was made as a visual aid to be used in the education of diabetic patients and shows the relationship between carbohydrates and insulin. It also explains in lay language the meaning of various diabetic conditions. It has been produced on 16 mm. film in color and sound track with a running time of approximately 10 minutes. Appropriate "hand-out" literature accompanies the film.

Showings at diabetic clinics, diabetic lay societies, and other diabetic groups must be requested by the medical or allied professions to Ames Company, Inc., Elkhart, Indiana, or an Ames representative.

Having a baby is not only safer today for both mother and child than it was 25 years ago, but measured in equal dollars, it is also about 18 per cent less expensive, according to Health Information Foundation.

One-third of the people of the United States today are infected with live tubercle bacilli, according to the National Tuberculosis Association.

Medicine as a profession still has a strong appeal among young people. A recent report by the American Medical Association shows that 7,686 students, a record number, entered medical schools in the 1955-56 academic year. Of this number, 5,753, or 75 per cent, had had four years of college education.

Causes of Death in 1956

| | All Ages | Ages Under 40 | Ages 40 thru 59 | Ages 60 and Over |
|--|-------------|---------------------|-----------------------|------------------------|
| Disease of Heart and Circulatory System | 62.2% | 16.2% | 54.8% | 66.7% |
| Cancer | 17.6 | 17.7 | 22.4 | 16.2 |
| Accidents | 4.4 | 41.0 | 6.7 | 1.9 |
| Influenza and Pneumonia | 2.3 | 2.1 | .9 | 2.7 |
| Suicide | 1.3 | 3.8 | 3.1 | .7 |
| Diseases of Kidneys | 1.1 | 1.0 | .9 | 1.1 |
| Tuberculosis | .4 | .5 | .5 | .4 |
| All Other Causes ... | 10.7 | 17.7 | 10.7 | 10.3 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |

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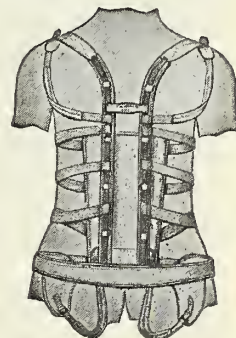
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A new concept is emerging of the kinds of services and facilities that will be required for comprehensive care of the chronically ill, the disabled, and the aged. This concept recognizes the need for a wide variety of services and facilities, but the emphasis is on prevention and rehabilitation. The patient is viewed as a person in his home in his own community where he will receive the greatest part of his care under the supervision of his personal physician. The community remains the central factor in any plan for his care.—*Leonard A. Scheele, M.D., Public Health Reports, January, 1956.*

The United States Treasury Department notes that

the automatic extension feature for maturing Series E bonds has resulted in 68 per cent retention beyond maturity date. Dollarwise, this figure amounts to a national total of \$13 billion 987 million.

Graduate fellowships in industrial medicine offered by University of Cincinnati Institute of Industrial Health. Information available from secretary, College of Medicine, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Expectant mothers average nine consultations with their doctors before the birth of their babies, the Health Information Foundation reports.

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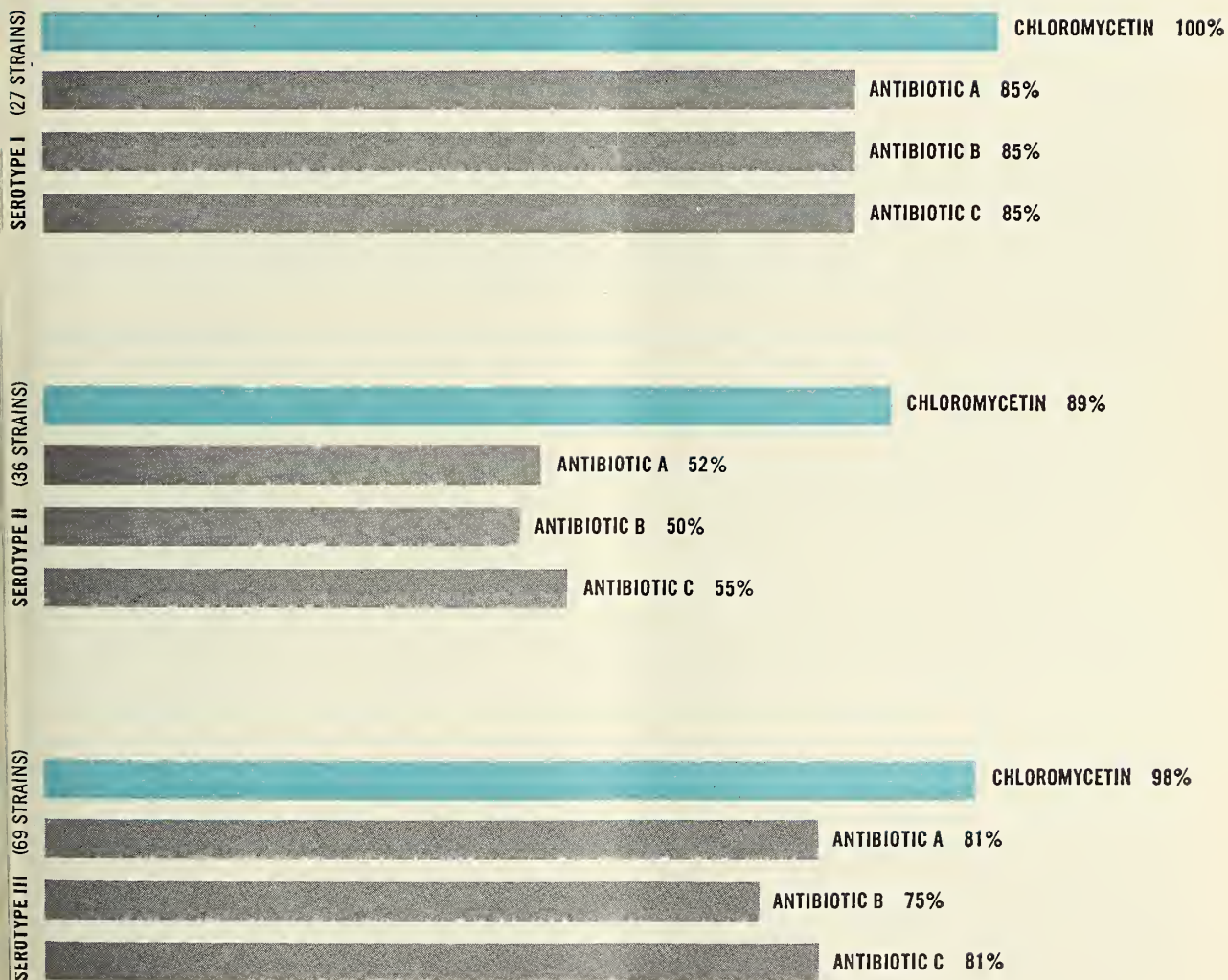
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JULY, 1957

No. 7

Lung Cancer

A Problem Emphasized by Increasing Frequency of This Lesion

MARTIN J. FITZPATRICK, M.D., *Kansas City*

The second quarter of the 20th century has been marked by an increasing medical awareness of the growing problem of primary lung cancer. Since 1930, mortality from these tumors has increased 500 per cent, and in many communities primary bronchogenic carcinoma has become the commonest malignant tumor of the adult male.¹ We are all aware of a changing epidemiological knowledge concerning pulmonary carcinogenesis, with the gradual removal of this entity from the domain of a pure occupational disease and its evolution into an every-day problem for the practicing physician.

Ever since the 16th century description by Paracelsus of the "mala metallorum" of the Schneeberg miners of Saxony, man has been vaguely aware of lung cancer associated with mining.² It was later established that radioactivity in these mines was the contributing factor, a fact further documented recently in the uranium mines of Joachimstal, now behind the Iron Curtain.³ Down through the years an increased occupational toll of lung cancer has been noted in radium laboratory workers, in nickel refineries, and in chromate workers, among others.^{4,5}

Of the 27,000 Americans who died of lung cancer in 1955, few were employed in these industries, and epidemiologists for many years have been seeking other explanations. To date it has been strongly suggested that increasing industrial atmospheric pollution, growing use of carcinogenic petroleum derivatives, and the four-fold rise in the cigarette smoking habits of our civilization are probably all likely contributors to the steadily rising tide of pulmonary

carcinogenesis.^{6,7} The growing statistical evidence linking excessive cigarette smoking with some forms of bronchogenic carcinoma has been further augmented by recent careful pathologic examinations of the respiratory system.⁸ These studies have shown an additional significant association between excessive smoking and pre-cancerous lesions of the lung.⁹ While future studies will be required to prove many of these complex problems, knowledge of their existence,

The seven-year experience at this hospital with some 400 patients with lung cancer has been reviewed. There were seven surgical patients living at least five years after diagnosis. Factors contributing to a successful outcome have been noted.

however, does offer today's citizens, including physicians, an opportunity to practice some form of preventive measures.

In considering our present treatment of lung cancer, the picture across the nation remains a gloomy one. Our best method of treatment, surgical extirpation of the lesion, often appears to be only a palliative tool and is at best available to about one-third of the lung cancer population.¹⁰ Despite the pursuit of an aggressive surgical attack on this problem in the 20 years that followed the first successful pneumonectomy for lung cancer, patient survival has not improved. For despite the striking growth in skill of the thoracic surgical attack in this period of time, there has been no appreciable improvement in finding patients earlier in the course of their disease.

Turning to this community, an analysis of a seven-

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CANCER OF LUNG

K. U. M. C.
1948-1955

| | | |
|-----------------------|--|------------------------------------|
| Total Patients | 428 | |
| Male | 360 (84%) | |
| Female | 68 | |
| Dead | 391 (91%) | Five Year Survival 7 (1.7%) |
| Treatment | | |
| None | 187 (44% of total) | |
| Surgery | 126 (29% of total) | |
| Palliative | 45 | |
| "Curative" | 81 (64% of those operated; 19% of total) | |
| X-Irradiation | 97 (25% of total) | |
| Nitrogen Mustard | 15 (3.5% of total) | |
| Others | 3 | |
| | ⊙ Combined with X-Irradiation 7 | |
| | ⊙ Combined with Nitrogen Mustard 10 | |

Figure 1. Patient survival and types of treatment given.

year experience with primary lung cancer at the University of Kansas Medical Center has been made. Some of the statistics used in this study have been obtained from the tumor register maintained at this hospital since 1948. Other data were obtained from study of hospital charts and records, including roentgenograms. When possible, five-year survivors with lung cancer have been interviewed and studied from the point of view of recurrence of tumor. When this was not possible, the personal physician of the survivor was contacted and asked to report on the patient. In addition, commoner male tumors were also studied during this same period of time for comparative purposes. Since the bulk of these patients were referred by practicing physicians from the state of Kansas, it should prove of interest to attempt an

analysis of some factors responsible for a successful outcome in the few five-year survivors.

Results

In the seven years between 1948 and 1955, 428 patients were diagnosed as having primary lung tumors. As seen in Figure 1, a large number were deemed inoperable, and a definitive surgical attack was made on only 19 per cent of all patients. Of those patients operated on, roughly two-thirds were considered to be "curative" procedures. Of these, seven have survived at least five years. There were no comparable non-surgical survivors, and 91 per cent of all patients were dead when this analysis was made.

Figure 2 shows the age distribution between three commoner male tumors studied in this group of patients. In this series carcinoma of the lung generally appeared earlier than the other tumors, with prostatic malignancies being seen in an older group of males. This fact should be emphasized in considering

COMPARATIVE MALE CANCERS

| | | | |
|--|----------------------|----------------|-----------------|
| | K U M C 1948-1955 | | |
| | Lung | Stomach | Prostate |
| Total Patients | 360 | 181 | 431 |
| % Receiving "No Treatment" | 44% | 33% | 6% |
| Alive at Time of Study (Patients) | 31 | 22 | 152 |
| 5 Year Survivals (Patients) | 6 | 6 | 76 |

Figure 3. Results of treatment of male cancers.

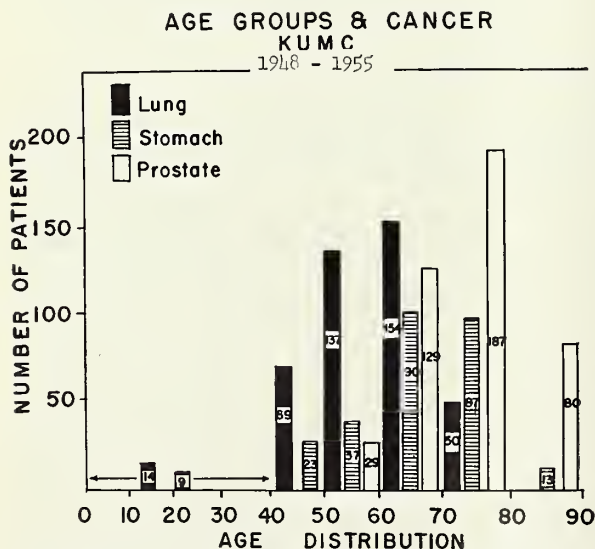


Figure 2. Age grouping of three male cancers.

survival from these different tumors, for the attrition from cardiovascular and infectious diseases should be greater in the older population. Figure 3 points out the differing therapeutic implications of these tumors, as well as the remarkable difference in survival of male patients with cancer of the prostate. This striking difference points out the importance of true therapeutic and palliative agents available in the management of hormonally dependent male tumors. However, many of these prostatic malignancies were diagnosed histologically, without clinical evidence of invasion at the start of treatment.

The seven known five-year surgical survivors are described in Figure 4. It should be noted that most of these patients had symptoms of relatively short duration preceding thoracotomy. All of the males had a central, obstructing, well differentiated squamous-cell tumor, only half of which could be identified through the bronchoscope. In two males, the can-

Clinical Data on Surgical "Cures"
KUMC
1948-1955

| Patient Age at Operation Race, Sex | Duration of Symptoms | Occupation | Bronchoscopic Biopsy | Surgical Procedure | Tumor Classification | Regional Lymph Node Metastases | Known Survival |
|--|----------------------------|----------------------|-------------------------|-------------------------|-------------------------|--------------------------------------|-------------------|
| 1 6M, 43yr, W O* | 1 Month | Warehouse Foreman | 0 | Left Pneum- onectomy | Squamous Cell Ca | + | 7 Years |
| 2 FN, 57yr, W O* | 5 Months | Housewife | 0 | Rt Lower Lobectomy | Anaplastic Ca | 0 | 8 Years |
| 3 CT, 60yr, W O* | 3 Months | Farmer | + | Rt Pneum- onectomy | Squamous Cell Ca | 0 | 9 Years |
| 4 JL, 60yr, W O* | 6 Months | Farmer | + | Rt Pneum- onectomy | Squamous Cell Ca | 0 | 5 Years |
| 5 HG, 60yr, W O* | 2 Months | Farmer | 0 | Rt Upper Lobectomy | Squamous Cell Ca | 0 | 7 Years |
| 6 DB, 64yr, W O* | 3 Months | Clerk | + | Left Pneum- onectomy | Squamous Cell Ca | 0 | 5 Years |
| 7 CC, 65yr, W O* | 4 Months | Farmer | 0 | Rt Pneum- onectomy | Squamous Cell Ca | + | 8 Years |

Figure 4. Clinical data on surgical survivors.

cer had metastasized regionally beyond the lung at the time of operation, despite which both patients are still living and free of tumor. These two individuals stress the often overlooked fact that the first successful pneumonectomy for lung cancer, done in 1933 by Dr. Evarts Graham on a fellow-physician, was for this same type of tumor.¹¹ In that instance regional metastasis outside of the lung had already occurred, despite which the physician was able to pursue a full 20 years of practice following operation.¹² It should also be pointed out that five of the seven survivors were age 60 or over at the time of operation, and that four have lived at least five years with only one lung. Thus age, in itself, should not be considered a contraindication to the required surgical procedure for removal of the malignancy.

A few of the survivors will be considered in greater detail to illustrate some important aspects of their clinical story. Mrs. F. N. was a 57-year-old housewife when first seen in 1949 with a five months' history of chronic cough and hemoptysis for two months. Chest roentgenograms (Figure 5) disclosed a mass in the right lower hilum, which on lateral view is seen in the superior segment of the lower lobe, overlying the 7th dorsal vertebral body. On study she was found to have a negative tuberculin skin test, a normal bronchoscopy, and no acid-fast bacilli on sputum smear. A right lower lobectomy

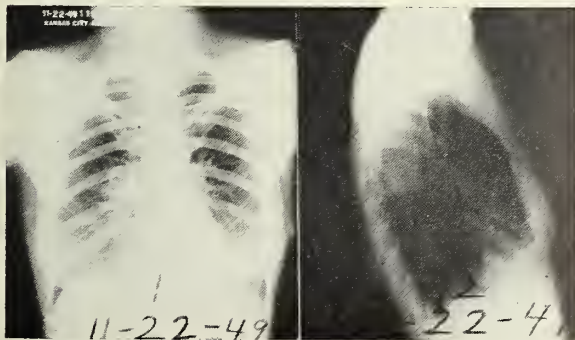


Figure 5. Preoperative roentgenograms on F. N. showing a right lower lobe mass.

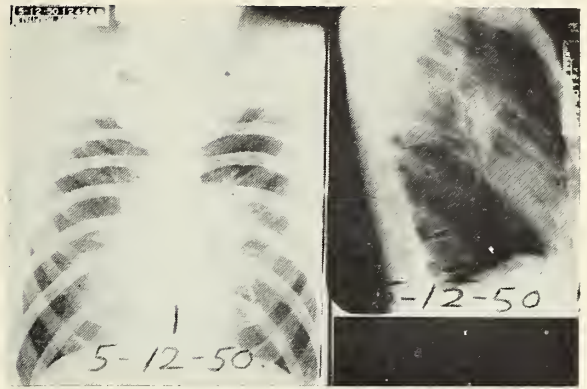


Figure 6. Preoperative roentgenograms on C. M. showing a left hilar mass.

was performed in 1949 for a necrotic, peripheral, anaplastic carcinoma. No tumor was found in lymph nodes removed with the specimen. This patient is living and well today without further treatment, free of evidence of tumor despite the limited resection for this poorly differentiated peripheral carcinoma. This is certainly an unusually fortunate result, far from the expected prognosis of this early metastasizing tumor.

Mr. C. M. was a 43-year-old foreman, referred in 1950 with a one month's history of persistent cough, associated with a mass in the left hilum shown in Figure 6. On study he was found to have a normal bronchoscopy, and laminograms (Figure 7) suggested a malignant tumor about the left upper lobe bronchus. He was found to have a tumor arising from the left upper lobe. A left pneumonectomy was carried out, and the specimen disclosed a well-differentiated squamous cell carcinoma, with metastatic tumor in the carinal and peribronchial lymph nodes. The patient had no further treatment and is living

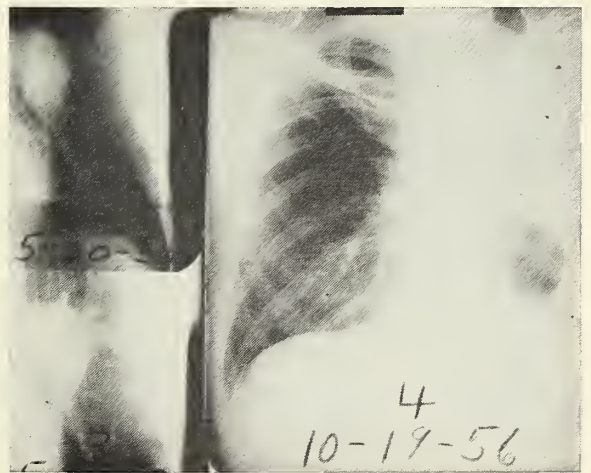


Figure 7. Preoperative laminograms of left hilar mass. Postoperative appearance of chest six years later.



Figure 8. Preoperative roentgenograms on H. G., showing obstructing right hilar mass.

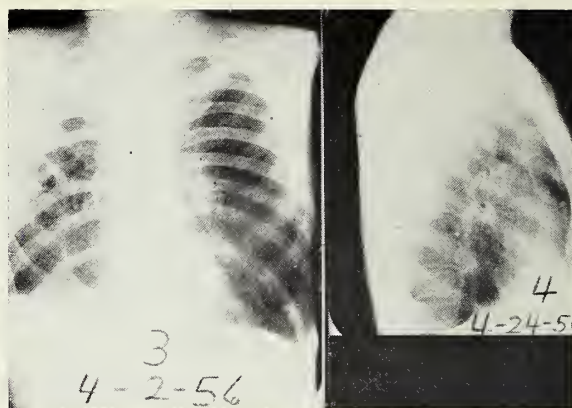


Figure 9. Postoperative roentgenograms on H. G. six years after lobectomy.

and well today, without evidence of recurrence of cancer.

The last representative patient, H. G., was a 60-year-old farmer referred in 1950 with a two months' history of chronic cough, weight loss, and a persistent abnormality of the right lung on repeated chest roentgenography, similar to that seen in Figure 8. Work-up included a normal bronchoscopy, and the patient subsequently was explored. He was found to have a tumor of the right upper lobe which was resected by a right upper lobectomy. The specimen contained a squamous-cell carcinoma, with no tumor found in the lymph nodes removed. This man had no further treatment and is living and well today without evidence of recurrence of cancer. Figure 9 shows postoperative chest roentgenograms no different from more recent ones. This patient demonstrates that a local resection of a malignant tumor of this type, in the absence of known metastases, can be followed by a six-year survival. This strongly suggests that other factors, at present unknown, governing rates of cell multiplication and invasion or spread of tumors may eventually call for a change in our thinking concerning the management of these lesions.

In analyzing this group of patients, one is struck by the fact that the majority of today's lung cancer patients are already inoperable when first studied, and are thus deprived of the only real chance for survival and cure. A principal cause for this disturbing situation is the lack of any real improvement in recent years in early detection of potential lung cancer victims in our patients or in the general population. The suspicion of lung cancer is generally entertained only after the pulmonary lesion has been demonstrated to be a persistent one. Since the chest roentgenogram continues to be our best method for early diagnosis of lung cancer, it should be remembered that suspicion leading to diagnosis is possible only when some manifestation of the invasive nature of the tumor has shown itself—thus, it is already a fairly advanced lesion. It is hoped that during the next seven-year period a practical clinical test for biologi-

cal activity of early tumors will be forthcoming, which will allow us to use our surgical tools to their greatest advantage. Beyond that, it can be hoped that other studies will eventually offer a practical method for prevention of most of today's pulmonary malignancies.

Acknowledgement

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Gastric Acidity

Study of Neutralizing Effects of Antacids and Discussion of Titrimetric vs. Electrometric Determinations

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PART I. A STUDY OF THE NEUTRALIZING EFFECTS IN THE HUMAN STOMACH OF COMMONLY USED ANTACIDS

There is as yet much to learn about the neutralizing effects of antacids in the human stomach as commonly used in the treatment of peptic ulcer. Two methods of study of this problem are at present available, namely, the recording of pH readings from an indwelling gastric electrode and, secondly, the study of acidity changes in aspirated gastric contents.

The recording of readings from an indwelling gastric electrode has been long in the process of development and is a method of much promise. However, it still awaits the development of an easily usable gastric electrode which must have the following qualifications to make its use easy and accurate. To permit long continued studies comfortably, it must be small enough for nasal introduction. It must be of suitable flexibility and suitably weighted at the distal end, so that it will always be accurately positioned by gravity when introduced into the stomach. This latter point is an important consideration, since the positioning of the tube in different parts of the stomach must be accurately controllable in order to obtain comparable readings. Third, from previous studies^{1, 3} it seems desirable that the small glass electrode bulb be sheathed in some type of fenestrated covering that will prevent it from lying directly in contact with the gastric mucosa, while allowing free flow of gastric contents over the bulb.

Since such an electrode is not completely worked out at this time, this study has utilized the method of aspirating small amounts of gastric contents at 15-minute intervals and the determination of the neutralizing effects of various antacids by titration of these specimens.

There are numerous reports of the theoretical and in vitro neutralizing values of various antacids, but

they are given in terms of various standards, such as 0.1 N HCl, 0.143 N HCl, 0.17 N HCl, 0.3 per cent HCl, 0.5 per cent HCl, etc. It would be desirable to use some single standard unit for these reports, and the natural one would seem to be milligrams or milliequivalents of HCl neutralized by a given amount of antacid, perhaps one gram.

Johnson and Duncan⁸ have devised a suitable method for testing the in vitro neutralizing power of various antacids measuring the amount of neutralization obtained in 10 minutes at 37 degrees Centigrade with stirring. This method may well be used for in vitro testing, and the use of the 10-minute reading is important, since in vivo the stomach is rather quick-

In Part I the relative neutralizing power of the commonly used antacids is evaluated. In Part II the difference between free acid readings determined electrometrically and those determined titrimetrically is emphasized.

ly emptying out any given antacid, and to be effective in vivo an antacid must neutralize quickly. The use of a 10-minute neutralization reading is a helpful means of judging the clinical value of an antacid. The neutralizing power of various antacids in vitro thus determined by Johnson and Duncan expressed in cc. of 0.1 N HCl and in milligrams of HCl neutralized is shown in Table I.

Kraemer⁸ found the relative in vitro neutralizing values of antacids to be as follows, expressed in relationship to sodium bicarbonate as 100 per cent:

| | |
|----------------------------|------|
| Magnesium oxide | 372% |
| Calcium carbonate | 177% |
| Sodium bicarbonate | 100% |
| Magnesium trisilicate | 100% |
| Tribasic calcium phosphate | 31% |
| Aluminum hydroxide gel | 13% |

The theoretical neutralizing power and the in vitro neutralizing power of various antacids give some indication of their probable effects in vivo. However, when it is realized that in the maximum hypersecretion in ulcer patients perhaps about 12,000 mgm. of HCl are produced in 24 hours, and that in the

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Since completion of this paper the first named author has received his M.D. degree from the University of Kansas School of Medicine and is now serving his internship at Camp Pendleton Naval Hospital, Camp Pendleton, California.

TABLE I

| <i>Antacid</i> | <i>Amount of Antacid</i> | <i>Cc. of 0.1 N HCl Neutralized in 10 Minutes</i> | <i>Mgm. of HCl* Neutralized in 10 Minutes</i> |
|---------------------------------|--------------------------|---|---|
| Magnesium oxide | 1 gram | 432 | 1576 |
| Aluminum hydroxide gel | 16.7 grams of 6% gel | 280 | 1022 |
| Calcium carbonate | 1 gram | 175 | 638 |
| Aluminum hydroxide powder | 1 gram | 130 | 474 |
| Sodium bicarbonate | 1 gram | 118 | 429 |
| Magnesium trisilicate | 1 gram | 92 | 335 |
| Aluminum trisilicate | 1 gram | 36 | 131 |

* 1 cc. of 0.1 N HCl contains 3.65 mgm. of HCl

Vol. of HCl in cc. x normality = milliequivalents of HCl in that volume

Vol. of HCl in cc. x normality x 36.5 = milligrams of HCl in that volume

average duodenal ulcer patient around 5,000 mgm. of HCl are produced each 24 hours, and that this latter amount would be completely neutralized by 8 grams of calcium carbonate, it becomes evident that the in vitro neutralizing effects of the antacids are greatly reduced in the stomach, and their actual effects can be determined only by in vivo studies. The effect of an antacid in the stomach is greatly modified by the constant emptying process of the stomach, the rate of reaction of the antacid, and perhaps by little understood diffusion processes in the stomach wall between the gastric contents and the blood plasma.

Sippy^{9, 10} and Palmer and Kirsner^{11, 12} and others have done much work evaluating the in vivo effects of antacids in ulcer patients. On the basis of in vivo studies, Kirsner and Palmer¹¹ rate the various antacids as follows in decreasing order of neutralizing effects:

1. Calcium carbonate 4.0 grams
2. Calcium carbonate 2.0 grams

3. Heavy powders—Calcium carbonate 2 grams, and sodium bicarbonate 2 grams

4. Aluminum hydroxide 30 cc.

5. Intermediate powders—Calcium carbonate 1.2 grams, and sodium bicarbonate 2 grams

6. Tricalsate 4.0 grams

7. Tribasic calcium phosphate 4.0 grams

8. Aluminum hydroxide 16 cc.

9. Simple powders (Sippy No. 1)—Calcium carbonate 0.6 gram, and sodium bicarbonate 2.0 grams

10. Sodium bicarbonate 4.0 grams

11. Aluminum hydroxide 4 cc.

12. Magnesium trisilicate 1.0 gram

The above evaluation was obtained on the basis of hourly aspirations over an entire day. In our study we have desired to see what information could be gained from more frequent aspirations at 15-minute intervals after administration of a number of the antacids in clinical use and in clinically usable dosages. The theoretical 10-minute neutralizing power, based on Johnson and Duncan's values in Table I of each

TABLE II

| <i>Antacid</i> | <i>Amount of Antacid</i> | <i>Theoretical Neutralizing Power</i> | |
|---------------------|-----------------------------------|---------------------------------------|-----------------------|
| | | <i>IN CC. OF 0.1 N HCL</i> | <i>IN MGM. OF HCL</i> |
| No. II Sippy tablet | Sodium bicarbonate 10 grains | | |
| | Magnesium oxide 10 grains | 365 | 1332 |
| | Sodium bicarbonate 30 grains | | |
| No. I Sippy tablet | Calcium carbonate 10 grains | 353 | 1288 |
| | Calcium carbonate 30 grains | 350 | 1277 |
| | Amphojel 30 grains | 260 | 949 |
| Sodium bicarbonate | 30 grains | 236 | 861 |
| Gelusil | 35 grains | 236 | 861 |
| Liquid Gelusil | 12 cc. | 236 | 861 |
| Robalate | 30 grains | | |

of the antacids in the amounts used in this experiment, is shown in Table II.

Method of Study

All studies were made on one trained subject, a normal, healthy male, 27 years of age. Fifty-one experiments, each of five hours' duration, were carried on nearly daily over a period of three months. The same standard breakfast consisting of orange juice, oatmeal with milk and cream, buttered toast, and coffee was ingested each morning at 8:00 o'clock. At 8:30 a.m. a Levine tube, size 14F, was introduced through the nose to a distance of 26 inches. The Levine tube was of such weight and flexibility that in this subject at this distance the end of the tube went immediately into the pyloric portion of the stomach and remained there. It was checked fluoroscopically, daily at first and later every two or three days. On every x-ray check the end of the tube was found positioned in the pyloric antrum. This is important as in different subjects and with different weights and flexibilities of the Levine tube, the end of the tube may take various positions in the stomach. The tube was maintained in situ for the duration of each daily experiment.

Aspirations of 5 cc. of gastric contents were begun at 9:00 a.m. and carried out at 15-minute intervals until 1:00 p.m. The antacid was given with 100 cc. of distilled water each hour, at 9:00 a.m., 10:00 a.m., 11:00 a.m., and 12 noon, immediately after the removal of the 5 cc. aspiration sample on the hour. Except for the liquid Gelusil, the antacids were given in tablet form, the tablets being crushed a few times by the teeth and washed down with 100 cc. of water. The following determinations were made on each specimen using a Beckman pH meter for the pH readings and standard 0.1 N NaOH solution:

1. pH of the aspirated specimen
2. Titration of free acid with 0.1 N NaOH to end point of pH 3.5
3. Further titration with 0.1 N NaOH to bring specimen to color change with phenolphthalein indicator for total acidity

After a control day for each series, the antacids were used in order on consecutive testing days. It was planned to have a total of five series of determinations on each antacid. However, due to time limitations of the subject, only four series of determinations were made on liquid Gelusil and Robalate, and three series on milk and cream, calcium carbonate with milk and cream, and Amphojel with milk and cream. It would seem desirable in general to use a minimum of five experiments even when using the same subject, to prevent errors from the daily fluctuations that occur in gastric secretions.

However, the general pattern of reaction to each antacid was fairly uniform throughout, and it would seem, in an experiment of this nature with a trained subject, that five repetitions of each series give an accurate picture.

In an experiment of this kind, there is not space to present all of the readings taken, but the results may be portrayed in two ways as presented in Table III. In this table the average of all of the 15-minute readings in clinical units of free acid for the same period of time is given, and likewise the number of readings without any free acid is also given. Each of these methods reveals the relative neutralizing effects of the different antacids.

In Table III the lettered columns represent the following experiments:

Column A: Control Series—100 cc. distilled water at 9-10-11-12

Column B: Milk and cream—100 cc. milk and cream at 9-10-11-12

Column C: Sodium bicarbonate—grains 30 with 100 cc. distilled water at 9-10-11-12

Column D: Sippy No. 2—1 tablet (sodium bicarbonate grains 10 and magnesium oxide grains 10) with 100 cc. distilled water at 9-10-11-12

Column E: Calcium carbonate—3 tablets (grains 30) with 100 cc. distilled water at 9-10-11-12

Column F: Calcium carbonate—3 tablets (grains 30) with 100 cc. milk and cream at 9-10-11-12

Column G: Amphojel—3 tablets (grains 30) with 100 cc. distilled water at 9-10-11-12

Column H: Amphojel—3 tablets (grains 30) with 100 cc. milk and cream at 9-10-11-12

Column I: Sippy No. 1—1 tablet (sodium bicarbonate grains 30 and calcium carbonate grains 10) with 100 cc. distilled water at 9-10-11-12

Column J: Robalate—4 tablets (grains 30) with 100 cc. distilled water at 9-10-11-12

Column K: Gelusil—3 tablets (grains 35) with 100 cc. distilled water at 9-10-11-12

Column L: Liquid Gelusil—12 cc. with 100 cc. distilled water at 9-10-11-12

Discussion

The degree to which the acidity of the gastric contents should be reduced to permit healing of peptic ulcers is not known.¹³ Some assume that it should be reduced to the so-called proteolytic end point of pH 4.5 to 5, at which pepsin is no longer active. More believe that if the free acid is abolished, which occurs at pH 3.5, healing occurs. There is clinical evidence that healing certainly occurs when the acidity is not reduced to this point. However, it would seem desirable to reduce the acidity to the point of no free acid insofar as it is possible to do so.

TABLE III

| TIME | Control A | Milk and Cream B | Sodium Bicarbonate C | Sippy II D | Calcium Carbonate E | Calcium Carbonate With Milk & Cream F | Amphojel G | Amphojel with Milk & Cream H | Sippy I I | Robalate J | Gelusil K | Liquid Gelucil L |
|--------------------------------------|--------------|---------------------|-------------------------|---------------|------------------------|---|---------------|------------------------------------|--------------|---------------|--------------|---------------------|
| 9:15 | 23 | 21 | 15 | 4 | 4 | 9 | 9 | 5 | 0 | 0 | 12 | 5 |
| 9:30 | 24 | 27 | 12 | 3 | 3 | 2 | 8 | 11 | 0 | 0 | 17 | 10 |
| 9:45 | 30 | 28 | 11 | 8 | 0 | 6 | 15 | 18 | 5 | 11 | 21 | 16 |
| 10:00 | 37 | 30 | 14 | 11 | 5 | 11 | 35 | 14 | 17 | 16 | 19 | 17 |
| 10:15 | 46 | 27 | 30 | 0 | 0 | 0 | 20 | 9 | 0 | 12 | 3 | 18 |
| 10:30 | 35 | 33 | 15 | 4 | 4 | 0 | 9 | 10 | 5 | 12 | 16 | 29 |
| 10:45 | 40 | 38 | 12 | 5 | 3 | 0 | 21 | 16 | 18 | 21 | 32 | 30 |
| 11:00 | 41 | 50 | 38 | 22 | 8 | 0 | 17 | 26 | 29 | 39 | 30 | 35 |
| 11:15 | 27 | 25 | 19 | 3 | 0 | 0 | 11 | 21 | 22 | 4 | 17 | 16 |
| 11:30 | 30 | 17 | 22 | 0 | 0 | 0 | 5 | 30 | 44 | 18 | 10 | 20 |
| 11:45 | 23 | 35 | 26 | 3 | 8 | 0 | 13 | 36 | 38 | 20 | 17 | 27 |
| 12:00 | 33 | 49 | 25 | 12 | 34 | 0 | 22 | 39 | 37 | 21 | 15 | 47 |
| 12:15 | 31 | 34 | 2 | 3 | 0 | 0 | 9 | 5 | 3 | 7 | 17 | 16 |
| 12:30 | 39 | 22 | 0 | 9 | 11 | 0 | 12 | 4 | 9 | 10 | 15 | 39 |
| 12:45 | 44 | 31 | 17 | 22 | 13 | 0 | 15 | 25 | 30 | 28 | 20 | 42 |
| 1:00 | 51 | 46 | 11 | 25 | 30 | 0 | 8 | 27 | 58 | 7 | 39 | 43 |
| Average free HCl | 34 | 33 | 17 | 8 | 8 | 2 | 14 | 18 | 20 | 14 | 19 | 26 |
| Total No. of 15- minute readings | .75 | 48 | 70 | 78 | 74 | 46 | 75 | 47 | 73 | 53 | 71 | 60 |
| No. of readings no free acid | 1 | 0 | 30 | 50 | 45 | 39 | 22 | 10 | 33 | 20 | 12 | 6 |
| % of times of no free acid | 1 | 0 | 43 | 64 | 61 | 85 | 29 | 22 | 45 | 38 | 17 | 10 |

The testing of 15-minute aspiration samples reveals how difficult it is to attain complete neutralization with antacids alone, due largely to the constant emptying of the stomach which tends to rather quickly pass the antacids out of the stomach and thus greatly decrease their neutralizing effects.

The persistence of considerable free acid in these experiments on the hourly administration of antacids in a normal subject makes it clear that continuous neutralization of free acid by antacids alone will usually not be obtained in hypersecreting ulcer cases and certainly dictates that the amount of antacids administered should not be less than those used in this study. Based on the amount of the average reduction of free acid determined by the titration of the 15-minute samples, the neutralizing value of the antacids used would be in the following order of descending value:

| | Clinical Units |
|--|---------------------|
| No. II Sippy—1 tablet | average free acid 8 |
| Calcium carbonate—3 tablets (grains 30) | " " " 8 |
| Amphojel—3 tablets (grains 30) | " " " 14 |
| Robalate—4 tablets (grains 30) | " " " 14 |
| Sodium bicarbonate—3 tablets (grains 30) | " " " 17 |
| Gelusil—3 tablets (grains 35) | " " " 19 |
| No. I Sippy—1 tablet | " " " 20 |
| Liquid Gelusil—12 cc. | " " " 26 |
| Milk and cream—100 cc. . . | " " " 33 |
| Control | " " " 34 |

Arranged in order of neutralizing value as determined by the percentage of the 15-minute aspirations showing no free acid, the antacids would be in the following order of descending value:

| | | |
|------------------------|-----------------------|-----|
| No. II Sippy | No free acid readings | 64% |
| Calcium carbonate ... | " " " " | 61% |
| No. I Sippy | " " " " | 45% |
| Sodium bicarbonate ... | " " " " | 43% |
| Robalate | " " " " | 38% |
| Amphojel | " " " " | 29% |
| Gelusil | " " " " | 17% |
| Liquid Gelusil | " " " " | 10% |
| Milk and cream | " " " " | 0% |
| Control | " " " " | 1% |

In Column F of Table IV, an interesting experience is shown, namely, that when the same amount of calcium carbonate is given with half and half, instead of with water, its neutralizing effects were markedly increased in a set of three daily experiments. However, when Amphojel was given with half and half, instead of with water, its neutralizing effects were not increased. This result needs further study to prove or disprove these findings.

Conclusions

1. On the basis of testing of 15-minute aspiration samples of gastric contents, the relative neutralizing power of the commonly used antacids was evaluated.

2. The difficulty and improbability of complete neutralization of free acid by antacids alone given intermittently are demonstrated. This is undoubtedly due to the rapid elimination of the antacids from the stomach while more hydrochloric acid is being formed.

3. Certainly smaller amounts of antacids than those used in this study would be of relatively little neutralizing value.

4. The use of milk and cream with calcium carbonate greatly increased the neutralizing effects of the calcium carbonate.

5. Hourly feedings of milk and cream alone do not lower gastric acidity.

6. The use of one antacid (Gelusil) in liquid form did not give as good neutralization as the same antacid in tablet form.

PART II. TITRIMETRIC VERSUS ELECTROMETRIC DETERMINATIONS OF FREE HYDROCHLORIC ACID IN GASTRIC ANALYSIS

One of the most commonly used measurements in the study of gastric contents is that of free acidity determined titrimetrically with the use of 0.1 N NaOH

to a color end point with Topfer's reagent or to an electrometric end point of pH 3.5 through the use of a pH meter. A second method of measuring the acidity of gastric contents is the measurement of the pH of the gastric content either intragastrically through an indwelling gastric electrode or on aspirated specimens which may be mathematically transferred into degrees of free hydrochloric acid. In this study on relative neutralizing power of various commonly used antacids, an opportunity has been presented to compare the pH readings on over 700 aspirated gastric specimens with the titrimetrically determined free acid readings on these same specimens, thus giving an opportunity to compare and evaluate the two methods.

Method of Study

The method of study important to this part of the report is that under standardized conditions on the same trained subject, 15-minute aspirations of 5 cc. of gastric contents were done from 9:00 a.m. to 1:00 p.m. daily with various test antacids being given each hour with water or milk and cream, and also a control series with water alone and with milk and cream alone on the hour. The determinations on each specimen were made immediately after aspiration by the same individual (P.J.U.) through the entire series so as to insure uniform technical results. The following readings were made on each specimen using a Beckman pH meter for the pH readings and standard 0.1 N NaOH solution:

1. pH of the aspirated specimen

2. Titration of free acid with 0.1 N NaOH to end point of pH 3.5

3. Further titration with 0.1 N NaOH to bring specimen to color change with phenolphthalein indicator for total acidity

For the purpose of this part of the report, only the above readings of No. 1 and No. 2 are used, consisting of the pH of the aspirated specimen and the clinical units of free acid as determined by titrating to an end point of pH 3.5. A graphic presentation of these readings is presented in Table IV.

For reference and for the sake of clarity, Table V is given to show the different modes of expressing gastric acidity.

Discussion

The findings in Table IV conclusively demonstrate that pH readings on gastric contents and titrimetric free acidity readings do not measure the same thing and cannot be transferred back and forth as equivalent readings. It is noted that practically without exception the titrimetric free acid readings are higher than free acid readings deter-

TABLE V
MODES OF EXPRESSING ACIDITY*

| <i>Clinical Units</i> | <i>Milliequivalents Per Liter</i> | <i>Per Cent</i> | <i>Milligrams Per cc.</i> | <i>Normality</i> | <i>pH</i> |
|---------------------------|---------------------------------------|-----------------|-------------------------------|------------------|-----------|
| 170 | 170 | 0.620 | 6.20 | 0.17 | 0.88 |
| 160 | 160 | 0.583 | 5.83 | 0.16 | 0.90 |
| 150 | 150 | 0.547 | 5.47 | 0.15 | 0.93 |
| 140 | 140 | 0.510 | 5.10 | 0.14 | 0.96 |
| 130 | 130 | 0.474 | 4.74 | 0.13 | 0.99 |
| 120 | 120 | 0.438 | 4.38 | 0.12 | 1.02 |
| 110 | 110 | 0.401 | 4.01 | 0.11 | 1.06 |
| 100 | 100 | 0.365 | 3.65 | 0.10 | 1.10 |
| 90 | 90 | 0.328 | 3.28 | 0.09 | 1.14 |
| 80 | 80 | 0.292 | 2.92 | 0.08 | 1.19 |
| 70 | 70 | 0.255 | 2.55 | 0.07 | 1.24 |
| 60 | 60 | 0.219 | 2.19 | 0.06 | 1.31 |
| 50 | 50 | 0.182 | 1.82 | 0.05 | 1.38 |
| 40 | 40 | 0.146 | 1.46 | 0.04 | 1.47 |
| 30 | 30 | 0.109 | 1.09 | 0.03 | 1.59 |
| 20 | 20 | 0.073 | 0.729 | 0.02 | 1.76 |
| 10 | 10 | 0.036 | 0.365 | 0.01 | 2.04 |
| 5 | 5 | 0.018 | 0.182 | 0.005 | 2.33 |
| 1 | 1 | 0.0036 | 0.036 | 0.001 | 3.01 |
| 0.1 | 0.1 | 0.00036 | 0.0036 | 0.0001 | 4.00 |

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mined by the pH reading. The meaning of this seems clear and does not detract from the value of each type of reading. The pH reading measures the free acid present at the moment of reading. The titrimetric free acid reading measures the amount of free acid present plus the additional amount of free acid liberated as hydrogen ion from a combined state, as titration is carried to the free acid end point of pH 3.5. In other words, the pH reading determines the actual free acid present. The titrimetric reading is that of the free acid actually present plus the potential amount of free acid that will be liberated if neutralization of gastric contents proceeds.

As an example, the free acidity as calculated for pH 1.9 would be 14 degrees. However, in Table IV for the first five control days, the free acidity readings by titration on the specimens showing a pH of 1.9 averaged 31 degrees. This same difference between the free acidity determined by the pH readings and the free acidity determined by titration is noted throughout all of the determinations.

Conclusions

1. The above study demonstrates and emphasizes the difference between the free acid readings determined electrometrically and titrimetrically, and

demonstrates that they actually measure different things.

2. The pH readings measure the actual free acid present and the titrimetric readings measure the actual free acid present plus the potential free acid that might be liberated from its combined state.

3. Although the total acidity readings are not presented in this paper, it is noted in our measurements that the greater the total acidity as determined by the phenolphthalein indicator, the greater is the difference between the pH free acidity reading and the titrimetric free acidity reading.

4. Table IV graphically portrays the relative neutralizing value of the commonly used antacids on a trained subject under uniform conditions by the degree of the shift of the pH readings to the right and by the relative number of readings with no free acid.

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(Continued on Page 472)

Abdominal Trauma

Rupture of the Jejunum and Hemopneumothorax following Non-Penetrating Trauma

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Periodic reports in the literature concerning rupture of the intestine from non-penetrating abdominal trauma make one cognizant that this entity must be considered in all cases seen in emergency states. The mortality rate is alarming if this condition is not recognized.

In 1935 Counseller and McCormack¹ reported on 1,313 cases with total mortality of 73.4 per cent. Poer and Woliver² in 1942 added 199 cases with a mortality of 61.2 per cent. Reports since then show a lower mortality with increased recognition and with more intensive management.

Perforation most commonly occurs in those areas of the intestine which are relatively fixed by mesenteric attachments, (1) duodenum, (2) jejunum near the ligament of Treitz, and (3) ileum just proximal to the ileocecum.

Case Report

This report is being presented to show an interesting traumatic case with several associated problems which arise from traumatic injuries seen in a small hospital.

A 20-year-old white male was brought to the emergency room by the police after having been thrown from a car in an accident in a small community near Dodge City. The exact circumstances surrounding the accident were unknown. He was found lying near a telephone pole, and it was presumed that he had been thrown and had struck his abdomen against it. He did not lose consciousness and was complaining only of severe pain over his appendiceal area when admitted. He felt that he had appendicitis.

Physical examination at that time revealed a 20-year-old white male in apparent shock. Blood pressure was 90/70. There was a small contusion over the left forehead. The right shoulder was deformed. The clavicle was separated from the acromion distally, and there was pain on motion of the shoulder. His respirations were labored. Both lung fields were initially clear to percussion and auscultation except for a diminution of breath sounds on the right side, but this was not marked. Examination of the head, ears, eyes, and throat was negative except for pallor

of the mucous membranes. Pupils were equal in size and reacted to both light and accommodation. There was some bleeding from mucosal tears in the mouth.

The abdomen had no scars. It was muscular and not distended. Liver, kidneys, and spleen were not palpable. There was a diffused tenderness with rigidity over the entire left side of the abdomen with minimal tenderness on the right side. The bladder was distended but not tender. There was no pain on pressure over the chest wall or on compression of the chest or hips. There was marked pain on compression over the abdomen. Back, joints, and extremities were negative except for deformity of the right shoulder.

Perforation of a hollow viscus must be suspected when there is persistent abdominal pain, spasm, and tenderness subsequent to severe trauma to the abdomen, either with or without nausea or vomiting.

Radiographs revealed the chest to be clear. There were separations of the sternal junction of the first, second, and third ribs with a fracture in the mid-axillary line on the third rib. There was a stellate fracture through the scapula itself.

During the course of the radiographs the man vomited approximately 2,000 cc. of thick food with no relief from pain. It was elected to explore him immediately. The preoperative diagnosis was (1) ruptured spleen and (2) rupture of a hollow viscus.

A small left rectus incision was made, and bleeding points were not clamped. The rectus fascia was split vertically, the muscle was separated, and the general peritoneal cavity was entered. A large amount of bluish blood presented itself shortly after the incision was opened. It was not welling up in the manner that one associates with a ruptured spleen, however. The incision was enlarged proximally and distally until the hand could be placed in the general peritoneal cavity. The spleen and liver felt normal but the stomach was dilated. A Cantor tube was passed into the stomach by the anesthetist. Intestines and stomach were then packed away medially and

distally until the spleen could be visualized, and there was no active bleeding. The small intestine was run for a distance of about one foot from the ligament of Treitz. Two holes were found in the jejunum, one measuring approximately 2 cm. across. The mucosa was everted. The holes were closed with intestinal suture in two layers with imbrication of the serosa over the holes. There was a tear in the mesentery of the jejunum, and this was closed on both sides. The examination of the rest of the ileum revealed no further injury. There was no Meckel's diverticulum.

Examinations of the liver, stomach, and gallbladder were normal. There was a large hematoma in the lesser omentum, and the entire lesser curvature of the stomach was surrounded by hematoma. The incision was closed without drains. The patient was given 1,000 cc. of whole blood and was returned to his room in a satisfactory condition.

The following morning he seemed to be in good condition. A catheter had been inserted into his bladder, and there were red and white cells in the urine specimen. These did not clear until his discharge from the hospital two weeks later.

On the first postoperative day his right chest filled with fluid, causing a loss of breath sounds from the right side and a definite lag of the chest on this side. A thoracentesis was done, and a No. 24 Robinson catheter was inserted in the chest cavity and placed in an underwater seal. About 500 cc. of liquid blood drained from the chest cavity. On the third day his chest was clear. He was passing gas. A repeat chest x-ray on September 4 revealed a pneumothorax still present. The hemothorax was gone. The lung was expanding. On September 5 the Cantor tube was clamped and the catheter was removed from his bladder; on September 6 the underwater seal was discontinued; on September 7 the Cantor tube was

removed, and he began to eat. The sutures were removed on the tenth postoperative day. The patient was ambulatory. He was discharged to return to the Navy on the 15th postoperative day.

The final diagnosis was fracture of the ribs fourth in the anterior axilla line; separation of the first, second, and third ribs from their sternal junction; stellate fracture of the right scapula with dislocation of the clavicle from the scapula; right hemopneumothorax; perforated jejunum; contusion of kidney and bladder and hematoma of the mesentery.

This paper is presented to illustrate how, without any external evidence of severe injury, this man was critically ill from complications that can arise from both abdominal contusions and chest injuries. It illustrates once again the necessity for a complete history and physical examination and careful watching of the chest in all traumatic postoperative patients.

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We Americans live in a scientific world. We use scientific and technological developments to reduce backbreaking labor, to gain shorter working hours and higher pay, to raise our living standards to the world's highest. That is why the scientist's job concerns everybody vitally. Today's pioneer does not wear a coonskin cap or shoulder a rifle. More likely he is wearing a laboratory apron and wielding a stirring rod. He continually finds new lands to explore in his test tubes. His hunting is done with the microscope. He seeks new horizons in the cyclotron.

—Robert E. Wilson

Colorado Tick Fever

Observations on Eighteen Cases and Review of the Literature

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Colorado tick fever, apparently the only tick-transmitted viral disease of man in the western hemisphere, was one of the unknown fevers encountered by the first immigrants in the Rocky Mountain region. It is an acute, benign, non-exanthemic disease characterized by an intermittent fever, which only in the past few years has been clearly recognized as a distinct disease entity.

The author had the opportunity to study a series of 18 cases of Colorado tick fever during the summer of 1955 in the Estes Park Clinic, Estes Park, Colorado. The purpose of this paper is to present an informative summary emphasizing the clinical observations on these cases, together with a review of the pertinent literature to complete the study of the disease.

Historical Background

Colorado tick fever has been experienced by white man since he first immigrated to the Rocky Mountain region. Undoubtedly it existed among the American Indians before that time. Early physicians in the region had difficulty in differentiating this non-exanthemic disease from malaria and typhoid fever, and often it was considered a mild form of either disease. As early as 1855, Ewing⁷ discussed "mountain fever" in the literature as an acute, benign, intermittent, non-exanthemic febrile disease. He reported a detailed account of the symptomatology, course, his treatment, and a proposal that the etiology was rarefied mountain air. Numerous reports^{25,33} of this mountain fever, which may have been confused with other fevers, appeared in Army medical reports in the latter half of the 19th century.

About 1873 an exanthemic fever (Rocky Mountain spotted fever) was first described, and this proved to be much more serious. Scientific studies of these mountain fevers as a group began about 1880. For several decades the true mountain fever was confused with the spotted fever and was usually considered a mild form of the latter; earlier, the observers of both considered them separate diseases. During the first

two decades of the 20th century, reports of mountain fever were overshadowed in the literature by the great interest in Rocky Mountain spotted fever. Not until 1926 did Becker reawaken some interest in the disease by suspecting the wood tick as the etiologic agent.

In 1930, Becker^{1,2} accurately described the clinical picture and proposed the name of Colorado tick fever, which still stands today. The following year Toomey^{29,30,31} wrote a number of articles on the

This study indicates that it is becoming increasingly important for doctors outside the endemic area of this disease to be able to diagnose Colorado tick fever since the areas of exposure are often frequented by tourists who can easily journey to their homes before the symptoms appear. This is especially important for physicians whose patients often vacation in tick-infested areas. Although the diagnosis of Colorado tick fever is not a life or death issue, it may save physicians embarrassment and further diagnostic studies.

same disease, still calling it American Mountain tick fever. Most of the work on Colorado tick fever has been done in the past 12 years at the University of Colorado Medical Center by Florio and his associates.

Etiology

The etiology of Colorado tick fever remained unproved until 1944 when Florio^{15,18} and associates experimentally transmitted the disease serially in humans and hamsters. They showed the causative agent to be a filterable virus transmitted by the bite of the wood tick, *Dermacentor andersoni* Stiles. The virus^{13,20,21} readily passes Berkefeld N and W candles and single Seitz EK pads. Using graded collodion membranes, the hamster-adapted virus was estimated by Florio, Mugrage, and Stewart¹³ in 1946 to have a diameter of ten millimicra. Koprowski and Cox^{20,21} estimated the diameter to be from 35 to 50 millimicra. The virus is stable, surviving for at least three and one-half years on ice and readily preserved by

This paper was written while the author was a student at the University of Kansas School of Medicine. He has completed an internship at the Weld County General Hospital, Greeley, Colorado, and is now beginning a residency in internal medicine at the University of Iowa Hospitals.

TABLE I
AGE, SEX, HOME OF PATIENT, HISTORY OF EXPOSURE, AND INCUBATION PERIOD.

| Case No. | Patient | Sex | Age | Home State or Country | Tick Exposure | Days before Symptoms |
|----------|---------|-----|-----|-----------------------|---------------|----------------------|
| 1 | W.R.† | M | 45 | Colo. | bite | ? |
| 2 | E.P. | M | 56 | Nebr. | bite | 5-7 d. |
| 3 | J.D. | M | 19 | Iran | bite | 2½ d. |
| 4 | F.S. | M | 60 | Nebr. | bite | 1 d. |
| 5 | E.H. | M | 17 | Fla. | bite | 5 d. |
| 6 | A.H.† | M | 54 | Ind. | body contact | ? |
| 7 | A.Mi. | M | 72 | Nebr. | bite | 3 d. |
| 8 | A.Me. | F | 6 | Ill. | bite | ⊕ |
| 9 | K.F. | M | 9 | Mo. | bite | 2 d. |
| 10 | H.D.† | M | 45 | Ill. | body contact | 2 d. |
| 11 | B.M.† | M | 53 | Nebr. | bite | 2 d. |
| 12 | H.B. | M | 16 | Ill. | bite | 2 d. |
| 13 | C.N. | F | 18 | Colo. | bite | 3 d. |
| 14 | G.M.† | M | 72 | Kans. | bite | 2 and 4 d. |
| 15 | J.Z. | M | 24 | Nebr. | bite | 7 d. |
| 16 | F.K. | M | 50 | Fla. | bite | ⊕ |
| 17 | C.W.* | M | 45 | Colo. | bite | 3 d. |
| 18 | H.J.* | F | 43 | Colo. | bite | 1 d. |

* Native to tick infested areas.

† Summer residents in tick infested areas for several years.

⊕ Tick first found at time of physical examination.

freezing or drying. It is inactivated at 60 degrees Centigrade for 30 minutes.

The virus has been successfully transmitted in the following laboratory animals: golden hamster, white mice, dilute brown agouti mice, and developing chick embryos.^{17, 19, 21} Complement-fixation tests by DeBoer and associates⁵ and neutralization tests carried out in mice by Koprowski and Cox²² and others^{9, 26} have shown the Colorado tick fever virus to be different from the viruses of dengue, yellow fever, rabies, Russian spring-summer encephalitis, Venezuelan equine encephalitis, eastern and western equine encephalitis, Japanese B encephalitis, St. Louis encephalitis, lymphocytic chorio-meningitis, and louping-ill, as well as from the rickettsiae of Rocky Mountain spotted fever, murine typhus, and American Q fever.

Many experimental viral studies have been done in the past decade. Further discussion of the virus is beyond the scope of this paper, and the interested reader is referred to the literature cited above.

Pathology

Pathological findings in the human having Colorado tick fever are unknown. No authenticated deaths due to Colorado tick fever have been reported. Furthermore, there are no reports in the literature

of autopsies being performed on persons having this disease and dying of other causes.

The only available information on pathology in this disease is from Black, Florio, and Stewart³ in their study of the golden hamster infected by the virus of Colorado tick fever. Their findings are limited to the spleen of the hamster. The splenic reaction is definite on the second day of the illness, is most pronounced on the third day, and is progressively less intense on the fourth and fifth days. Although gross swelling of the spleen is not a prominent feature, the term acute splenic tumor was applied by the above investigators.

The main microscopic findings are alterations in the cellular types and the arrangement of the follicular lymphoid tissue. There is an apparent reduction in the number of lymphoid cells in the central portion of the follicle, with the appearance throughout the follicle of large pale-staining mononuclear cells mingled with polymorphonuclear leukocytes and erythrocytes. These large mononuclear cells contain small, irregularly shaped masses of dark blue-staining materials resembling fragmented nuclei. The periphery of the follicle shows a partial or complete disappearance of the well-defined margin, being replaced by a ragged border of mononuclear cells with occasional neutrophils or erythrocytes.

Also in the hamster the average leukocyte count is lowest on the fourth day, at which time cytoplasmic bodies are usually found in the lymphocytes. The

previously described splenic reactions are well correlated with the leukocyte count and the presence of these cytoplasmic bodies.

Clinical Study

During the summer of 1955, approximately 25 patients at the Estes Park Clinic were suspected of having Colorado tick fever. Eighteen of these were observed and studied as well as was possible on an out-patient basis. A number were transient vacationers who were somewhat difficult to follow. All except three of the 18 cases were observed between June 7, 1955, and July 10, 1955, the three exceptions being observed during the month of August. The first period corresponds with the height of the tick season in the area and the second period with a rainy season which brought the ticks out of hiding again.

Age and Incidence

As can be seen in Table I, the ages of the patients varied between 6 and 72 years; however, most were adults. All but three were males. Although this series is far from large enough to make any conclusions about the age and sex of the patients, it seemed to roughly correspond with the population which was being exposed to the tick habitats. This agrees with the reports of other investigators of the disease.²³ The true incidence of the disease in any locale is, of course, difficult to determine, especially in a resort area where the population is highly mobile and transient. Patients in this series represent approximately one in every 175 patients who entered the clinic. It is difficult to estimate the number of persons having Colorado tick fever who did not seek medical advice at this central clinic. This is further discussed in the following section.

Epidemiology

Becker^{1,2} in 1930 suspected the wood tick as the transmitting agent of Colorado tick fever. In 1944, Florio and colleagues¹⁷ attempted to infect humans with supposedly infected ticks but failed; however, they were able to transmit the disease serially in humans by parenteral injection of the blood or serum of infected humans. The same investigators¹⁰ reported in 1948 the direct transmission of the disease from infected wood ticks to the golden hamster and in 1950¹² reported the isolation of the virus of Colorado tick fever from *Dermacentor andersoni* Stiles in nature. They also demonstrated the transovarial transmission of the virus in the wood tick.¹² In the same year these investigators^{10,11} reported the isolation of the virus of Colorado tick fever from the dog tick, *Dermacentor variabilis*, found on Long Island, New York.

The wood tick has an interesting life cycle, but a

complete description would be beyond the scope of this paper. Adult ticks are found on trees and underbrush usually from March to July, and occasionally as late as September. During dry, hot weather they seek the ground. It may be interesting to relate this fact to the cases being reported here. The area surrounding Estes Park in the summer of 1955 was cool and rainy during the months of June and August and was hot and dry during July. It was observed from the history of these cases that all except three were infected during June and the first week of July, the latter three during the month of August in the second rainy bout. According to the literature,⁸ the peak occurrence is usually in late May and early June.

The geographical distribution of Colorado tick fever follows the distribution of the wood tick, *Dermacentor andersoni* Stiles.^{6,10,23,30,32} The virus has been isolated from infected patients in California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming. The relative occurrence in these states from a series of 193 patients from whom the virus was isolated by the Rocky Mountain Laboratories, Hamilton, Montana⁶ (1948-1954) is as follows: (1) Idaho—52, (2) Colorado—38, (3) Nevada—34, (4) Oregon—26, (5) Wyoming—19, (6) Montana—16, (7) Utah—6, (8) California and Washington—1 each. The virus has been isolated from ticks in all of these states, thus making the disease endemic in the wood tick-infested areas of the above named states.

The popularity of the known endemic area of Colorado tick fever as a vacationland, the incubation period, and the speed of modern transportation are factors that make it possible for this disease to appear in any part of the United States or adjoining countries. Although the virus has been isolated from the dog tick in Long Island,^{10,11} no naturally-occurring cases of the disease from this vector in the dog or human have been reported in the literature.

Persons affected by the disease are those whose occupational or recreational activities bring them in contact with the wood tick, such as cattlemen, sheepmen, foresters, fishermen, and tourists. The disease is noted most often in visitors to the tick-infested areas and is relatively uncommon in the natives of these areas. This fact is borne out in the clinical series presented in this paper, as there were only two natives and five summer residents among the 18 cases in this study. Patients in this series listed their homes in seven states other than Colorado.

Incubation Period

It will be noticed from this series (Table I) and from the literature that all patients give a history of having been bitten by a tick, of having had a tick

TABLE II
SYMPTOMATOLOGY AND PHYSICAL
FINDINGS

| <i>Symptom</i> | <i>No. Having</i> | <i>Physical Findings</i> | <i>No. Having</i> |
|---------------------|-----------------------|------------------------------|-----------------------|
| Fever | 18 | Fever | 18 |
| Chilliness | 18 | Tachycardia | 18 |
| | | Conjunctival | |
| Malaise | 18 | Injection | 14 |
| Anorexia | 18 | Pharyngeal Injection | 12 |
| Muscular and | | | |
| joint pains | 17 | Hyperesthesia | 9 |
| Headache | 13 | Inflamed tympanic | |
| | | membrane and | |
| | | pharynx | 2 |
| Deep ocular pain .. | 11 | External otitis | 1 |
| Smoking—bad taste | 7 | | |
| Photophobia | 7 | | |
| Nausea | 5 | | |
| Dizziness | 4 | | |
| Constipation | 4 | | |

on their bodies, or of having been in a tick-infested area. The average incubation period in this series was about three days. However, it is difficult to obtain a reliable history as most patients do not know when the tick first became attached because it may be embedded in the body several days before it is first noticed. This is demonstrated by two patients who came to the clinic with typical symptoms, but ticks had not been found embedded in the skin until a careful physical examination had been performed. Thus the figure of three days is actually the average interval of time between the finding of the tick and the appearance of symptoms. Reports of this disease in the literature^{6, 10, 16, 23, 27, 29} generally state that the usual incubation period is four to five days. However, Florio et al.¹³ found the incubation period to be only three days in human volunteers injected with infected serum.

Symptomatology

Although Toomey (1931)²⁹⁻³¹ lists a number of prodromal symptoms, I found no such prodromata. On the contrary, I was impressed by the sudden onset of symptoms. The patient could usually name the hour in which the symptoms began, even if at night. Within an hour, almost all of the symptoms had appeared. These patients were conscious of the onset of fever which alternated with a sense of chilliness, but not a true chill. The oral temperature in these patients varied from 99.4 to 103.2 degrees Fahrenheit (in many, the temperature was undoubtedly lowered by the salicylates which had been taken previous to the clinic visit). Other observers state that the

temperature reaches a peak of 102 to 104 degrees Fahrenheit within the first 24 hours of symptoms.

With the onset of fever, the patient begins to have various muscle aches, which usually progress to marked muscular and joint pains throughout the body, particularly in the neck, back, and legs. A headache, which may be diffuse but is usually frontal in location and of varying severity, accompanies the onset. Within a short time the patient is overcome with a feeling of malaise and anorexia. For example, one patient was hungry shortly before mealtime, but by mealtime had considerable disinterest in food following the onset of symptoms. Other variable symptoms which soon may develop are deep ocular pain, photophobia, vertigo, nausea, vomiting, constipation, and a bad taste during smoking.

Course of Disease

These symptoms last 36 to 96 hours, the usual being about 48 hours. The average time for the first bout in this series was 56 hours (Table III). This was followed by a remission during which the patient was afebrile, often with a marked subnormal temperature, but was anorexic and had varying degrees of malaise. This remission lasts 24 to 72 hours, with an average length in this series of 53 hours. This average

TABLE III
COURSE OF DISEASE

| <i>Case No.</i> | <i>Approximate Duration of</i> | | |
|---------------------|--------------------------------|-----------|-------------|
| | FIRST BOUT | REMISSION | SECOND BOUT |
| 1 | 48 hours | 72 hours | 48 hours |
| 2 | 56 hours | 30 hours | 72 hours |
| 3 | 54 hours | 24 hours | 30 hours |
| 4 | 36 hours | 60 hours | 36 hours |
| 5 | 48 hours | 48 hours | 36 hours |
| 6 | 72 hours | 72 hours | 36 hours |
| 7 | 48 hours | 72 hours | 48 hours |
| 8 | 60 hours | * | |
| 9 | 60 hours | 72 hours | 48 hours |
| 10 | 72 hours | 60 hours | 72 hours |
| 11 | 48 hours | 36 hours | 48 hours† |
| 12 | 48 hours | | None |
| 13 | 48 hours | 48 hours | 36 hours |
| 14 | 48 hours | | None |
| 15 | 72 hours | 48 hours | 36 hours |
| 16 | 48 hours | * | |
| 17 | 96 hours | | None |
| 18 | 48 hours | 48 hours | 48 hours |
| Average | 56 hours | 53 hours | 46 hours |

* Patient discontinued treatment in remission.

† Patient No. 11 had a second remission of 36 hours, then a third bout lasted 48 hours.

excludes any patients who discontinued treatment during the remission and those who apparently had only one bout. The remission in most cases is followed by an exacerbation of symptoms similar to those found during the first bout. The second temperature rise gives the so-called saddle-back type of temperature curve. The duration of this second bout may be similar to the first, but in this data the average duration was approximately 46 hours in those 13 patients in whom we observed a second bout. Occasionally the patient may have only one bout, and rarely there may be three febrile bouts. The former was observed in 3 of the 16 adequately observed patients, and the latter was observed in only one patient.

Following the second bout the average patient slowly regains his appetite, but he may be weak for a varying length of time. Schaeffer²⁷ stated that the malaise is greater between the two bouts, and that only a day or two of weakness follows the second bout. According to Florio,^{14, 16} the patient feels tired for only a few days after the second bout. In following these 13 cases with second bouts, I observed that a marked weakness lasted for many days after the second bout in most cases. This is also the finding of Lloyd.²³ The malaise is said to be similar to that of dengue or influenza.^{9, 15}

Physical Findings

The relative absence of physical signs is a striking feature of this disease. All of these patients show an elevated temperature, the degree of which was described previously. Other findings include those that usually accompany a fever as: tachycardia, flushed facies, conjunctival and pharyngeal injection of varying degrees (see Table II). Occasional patients exhibit hyperesthesia over the sore muscles.

Toomey^{29, 30} states that the tips of the liver and spleen become palpable; however, other recent investigators do not report this finding. I was unable to palpate the liver or spleen on any of these 18 patients, even with diligent palpation. Although the lymph nodes do not become enlarged in uncomplicated Colorado tick fever, two of these patients (Cases No. 8 and No. 9) also exhibited the findings of acute pharyngitis and otitis media with cervical lymphadenopathy during the first bout. However, in view of the excellent response to penicillin therapy, the history and course of these cases (one showed a typical Colorado tick fever recurrence and the other left the city during the remission), the blood picture, and the presence of antibodies in the one patient, the diagnosis of Colorado tick fever, complicated by a bacterial infection (presumably streptococcal), was made. Another patient (Case No. 12) developed an

external otitis about one week after the onset of Colorado tick fever. It seems most probable that the viral disease lowered the patient's resistance to other infectious diseases.

Prognosis

The prognosis in Colorado tick fever is excellent. I have been unable to find in the literature any report of a death due to proved or suspected Colorado tick fever. The patients are left quite weak temporarily, but all eventually regain their normal health and strength.

Laboratory Findings

Marked leukopenia is one of the significant findings in Colorado tick fever. There is a fall in the white blood cell count which, according to most authorities,^{9, 23, 28} falls below 3,000 per cubic millimeter. The minimum count is usually reached during the second bout. One to four white blood counts were done on each of the patients in this series. Not all had counts that fell below 3,000, and I was unable to obtain a sufficient number of blood counts to make any valid conclusions. The average minimum white blood count was 3,255. A number of the patients in whom sufficient counts were obtained had minimum counts below 3,000 (eight of the 18 patients), and one patient's white blood count fell to 1,150. However, all had a minimum white blood count of 5,000 or less. Following the second febrile bout, the white count slowly returned to normal. Routine red cell counts were not done on these 18 patients. There is no change in the red cell count, according to the literature.

Although there are considerable individual variations in the differential counts, my studies on these patients showed a relative increase of 11 to 35 per cent in the lymphocyte count in eight of the ten patients with multiple hemograms. There was little significant change in the stab forms and a relative decrease in the segmented forms of polymorphonuclear leukocytes. There is considerable variation in reports on the differential counts in the literature.^{17, 23, 28} Urinalyses in six of these cases were entirely within normal limits.

Complement-fixing⁵ and neutralizing antibodies appear in human blood sometime between the ninth and 14th day of the illness and have been demonstrated to be present as long as 34 months later. The specific complement-fixing antigens for Colorado tick fever have been prepared from infected mouse brains. These tests have been shown by numerous investigators^{5, 9, 22, 26} to be specific for Colorado tick fever.

Single serum specimens were obtained from 11 of the 18 patients. Acute specimens were drawn on only

three of these. These three acute specimens showed no neutralizing antibodies, but the virus of Colorado tick fever was isolated in two of these specimens (through error, no attempt was made to isolate the virus in the third specimen). The virus is reported to be present in the blood during either the first or second febrile episode.^{16,17} Convalescent specimens were obtained at from four to seven weeks after the onset of the disease in eight patients. The remaining patients left the area before convalescent specimens were obtained. Although only one specimen was obtained on each of these eight patients, the demonstration of high antibody titer in a single specimen is probably significant of recent infection with Colorado tick fever, especially when the patient came from outside the endemic area, or gave a reliable negative history for this disease. It is recognized that a definite rise in antibody titer is necessary to establish the diagnosis accurately. However, in view of the difficulty of obtaining numerous blood specimens in this transient type of clinic patient, and considering the typical clinical picture, the author believes that these high titers are confirmatory diagnostic aids for the purpose of this paper.

Case Histories

The following case histories and laboratory findings will serve to specifically illustrate the course of Colorado tick fever.

Case No. 5, H. E. H. This patient was a 17-year-old white male from Florida who was working as a waiter near Estes Park. He was first seen in the clinic on June 15, 1955, with the history that he had found two ticks embedded in his skin on June 10. About two hours before coming to the clinic he had the sudden onset of symptoms of fever, chilliness, headache, sore back, and malaise.

Examination showed an oral temperature of 99.8 degrees Fahrenheit and a pulse of 100. The laboratory findings are listed below. On the following day the patient had, in addition to the above symptoms, anorexia, deep ocular pain, and marked muscle soreness. He had a temperature of 100 degrees Fahrenheit

(after salicylate therapy) and associated findings of a mild conjunctivitis and flushed facies. On the third day of his illness the only symptoms were anorexia, backache, and malaise. Temperature was 98.4 degrees Fahrenheit, pulse was 64. The next day the patient felt well enough to return to work, feeling only slight malaise, and his appetite was returning.

About noon on June 19, 1955, the patient suffered a relapse with sudden onset of fever, chilliness, generalized muscle and joint aches, anorexia, and malaise. Physical examination was again negative except for a temperature of 100 degrees Fahrenheit and mild associated findings. On the following day the patient's only symptom was malaise. Throughout the course of the disease there were no further findings on physical examination other than those noted in Table IV.

Case No. 18, H. J. This was a 43-year-old white woman whose home borders the tick-infested areas. She was certain that she had never had Colorado tick fever before. On August 22, 1955, she discovered a tick embedded in her skin and she thought it had become embedded the previous day. About 8:30 A.M. on August 22, she had the sudden onset of fever and alternating chilly sensations, headache, deep ocular pain, muscular and backaches, malaise, slight nausea, anorexia, and a "hot throat."

Physical examination at the first clinic visit revealed temperature of 101.2 degrees Fahrenheit, pulse of 110, and slight erythema of the pharynx. These symptoms continued into the night, and then the fever suddenly broke early the next morning. When she was seen in the clinic on August 23 the only symptoms were anorexia, malaise, and mild muscular aches; she had a temperature of 98.4 degrees Fahrenheit with no physical findings. During the next two days the patient's appetite improved and the malaise and muscular aches decreased. On the fifth day of her illness she suffered a relapse with symptoms of fever and alternating chilliness, headache, muscle and backaches, malaise, deep ocular pain, and anorexia. The only physical findings were a temperature of 100.8 degrees Fahrenheit, slight injection of the conjunctiva and pharynx, and a flushed

TABLE IV
WHITE BLOOD CELL STUDIES

| Date | WBC | % PMN | % Segmentors | % Band | % Lymphocytes | % Monocytes | % Eosinophils | % Basophils |
|---------------|------|-------|--------------|--------|---------------|-------------|---------------|-------------|
| 6-15-55 | 7800 | 71 | 69 | 2 | 20 | 3 | 6 | 0 |
| 6-16-55 | 4900 | 68 | 64 | 4 | 31 | 1 | 0 | 0 |
| 6-17-55 | 4600 | | | | | | | |
| 6-19-55 | 5100 | 77 | 74 | 3 | 18 | 1 | 4 | 0 |

TABLE V
WHITE BLOOD CELL STUDIES

| Date | WBC | % PMN | % Segmentors | % Band | % Lymphocytes | % Monocytes | % Eosinophils | % Basophils |
|---------------|------|-------|--------------|--------|---------------|-------------|---------------|-------------|
| 8-22-55 | 9450 | | | | | | | |
| 8-23-55 | 4600 | 67 | 62 | 5 | 27 | 3 | 3 | 0 |
| 8-24-55 | 4500 | | | | | | | |
| 8-26-55 | 4900 | | | | | | | |

facies. The following day the only symptoms were the decreasing anorexia, malaise, and muscular pains.

On August 22 a blood specimen was drawn and sent to the laboratory for analysis (Table V). The presence of the virus of Colorado tick fever was reported, and the specimen was entirely negative for neutralizing antibodies.

Immunity

None of these 18 patients gave a history of previous illness that could be called Colorado tick fever. Only two were native to tick-infested areas. This can certainly be taken to indicate that the majority of people native to tick country have at one time had Colorado tick fever and are now immune to the disease. Most of those having the disease are from areas foreign to the vector of Colorado tick fever. No individual has been known to have an authentic infection of Colorado tick fever a second time. Numerous investigators^{9,13,15,16} have tried unsuccessfully to develop the disease a second time in human volunteers who have previously had the disease. With this in mind, there have been experimental attempts^{21,22} to immunize volunteers against Colorado tick fever with an attenuated virus. Individuals have been successfully immunized, but only by means of suffering to varying degrees a minor case of Colorado tick fever. Thus it was decided that the effects of immunization for such a benign disease are of too little benefit to be used for the public.

Treatment

Since there is no successful anti-viral therapy, treatment consists primarily of symptomatic and supportive therapy with salicylates, codeine, and various other pain and muscle spasm relievers. In most patients we used desoxycorticosterone acetate in daily dosages of 7 to 10 milligrams, given intra-muscularly, for the duration of the symptoms. This was used with the idea that this cortical hormone helped the patient meet the stress of the disease and improved his sense of well-being. Our observations, although far from being objective, led us to believe that the morbidity of the disease was lessened by this drug. Since no controlled studies were done, however, no valid con-

clusions can be drawn on the use of desoxycorticosterone acetate in patients having Colorado tick fever.

Diagnosis

The history of sudden onset of fever, chilly sensation, anorexia, malaise, headache, backache, and generalized muscular aches, following the recent bite of a wood tick or in a patient who has been in a tick-infested area, should lead one to think of Colorado tick fever. The absence of rash or physical findings, other than those accompanying a fever, is significant in the diagnosis of Colorado tick fever. A white blood count taken on the first day of the illness will usually be within normal limits, but on the second day the leukopenia points out the viral etiology of the disease. The disappearance of fever and symptoms on the third or fourth day, with relapse one or two days later, makes the clinical diagnosis of Colorado tick fever presumptive unless proved otherwise. The clinical diagnosis can be confirmed by drawing a specimen of blood during one of the febrile periods and sending it to the laboratory for viral isolation.* After about the tenth day the presence of an increasing titer of complement-fixation and neutralizing antibodies is also diagnostic.

Differential Diagnosis

Although Colorado tick fever was formerly thought to be a mild form of Rocky Mountain spotted fever, it should not be confused with this much more severe disease. In Rocky Mountain spotted fever the characteristic exanthema makes its appearance between the second and sixth febrile day. This disease does not have the saddle-back course of fever and symptomatology seen in Colorado tick fever; rather, the fever continues from 15 to 20 days. Furthermore, this disease shows a leukocytosis rather than a leukopenia. The entire course of the disease is much more severe and prolonged than in Colorado tick fever.

Another viral disease with similar symptomatology

* This service is performed free of charge by Department of Health, Education, and Welfare; U. S. Public Health Service; Rocky Mountain Laboratory, Hamilton, Montana.

is influenza. One important consideration in differentiating this from Colorado tick fever is that influenza usually occurs in an epidemic form, whereas Colorado tick fever is strictly endemic. Furthermore, influenza usually occurs in the fall, winter and early spring, while Colorado tick fever occurs only during the tick season in the late spring and summer. Symptoms referable to the respiratory tract are common in influenza and almost never found in Colorado tick fever. Although the leukocyte count in influenza is low or normal, it is not uncommon for it to be slightly elevated; in Colorado tick fever, a moderate to marked leukopenia is the rule.

The course and symptomatology of dengue are similar to those of Colorado tick fever, but the geographical distribution of the two diseases is different; the former appears in tropical and sub-tropical countries, where it is transmitted by the *Aedes aegypti* mosquito. Also, dengue has a characteristic rash. Viral and antibody studies further differentiate the two diseases.

Perhaps other viral diseases may at first be confused with Colorado tick fever, but they should readily be ruled out after close observation of the course, symptomatology, and physical and laboratory findings.

Prevention

Since no satisfactory method of immunization has been developed, prevention of Colorado tick fever is best accomplished by avoidance of the wood tick. Any attempt to rid an area of the wood tick would obviously be impractical and improbable. If one plans to enter a tick-infested area, it is advisable that he wear suitable clothing such as high boots, leggings, or socks worn outside the trouser legs; thus it will be more difficult for the tick to become attached. Even if dressed properly, a person should check his body and clothing for ticks several times each day to prevent their becoming embedded in the skin, particularly the hairy areas.

Summary

Colorado tick fever has been described for over a century, but the present name was established only 25 years ago. In the last decade it has been proved to be a separate disease entity, and the vector has been proved to be the wood tick, *Dermacentor andersoni* Stiles. The virus has been isolated and has been successfully transmitted in a number of laboratory animals.

The reported pathological findings are limited to the changes in the spleen of the golden hamster.

The geographic distribution of Colorado tick fever follows the distribution of the wood tick which is chiefly in the western mountainous states.

Eighteen cases of Colorado tick fever were observed during the summer of 1955 in Estes Park. Clinical, physical, and laboratory findings are reported. No attempt was made to draw any conclusions or add any findings from this limited study.

The disease is characterized by the history of contact with a wood tick and the sudden onset of symptoms of fever, chilly sensation, malaise, anorexia, headache, muscular aches and pains, and a number of less consistent symptoms. The saddle-back course of fever and symptoms is characteristic. Physical examination is characteristically negative except for fever and findings accompanying fever. The main laboratory finding is marked leukopenia. The virus can be isolated from the blood during the acute phase, and complement-fixation and neutralizing antibodies are found during the convalescent phase.

Diagnosis of Colorado tick fever is made on the basis of history of exposure to the tick, characteristic symptomatology, absence of physical findings except those accompanying a fever, and characteristic laboratory findings. Treatment is at present only symptomatic. Prevention is best accomplished by avoidance of the tick.

Acknowledgements

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(Continued on Page 462)

PRESIDENT'S PAGE

DEAR DOCTOR:

There is need for better understanding of the much misunderstood Joint Commission on Accreditation of Hospitals. The able direction of Dr. Kenneth B. Babcock has produced an important instrument for maintenance of high quality of medical care.

Doctors who comprehend the aims of the commission recognize its effectiveness in supporting the actively vigorous processes of self-examination and self-discipline evident throughout organized medicine; that the commission is largely composed of and in control of doctors of medicine; that it is not a policing body; that it is merely a policy making unit which crystallizes principles of good medical practice and systematizes the rules by which a hospital staff may voluntarily promote and encourage high standards of conduct among its own members.

True, there have been, in the past, hospital surveyors who lacked tact and helpfulness and understanding, even arousing resentment and antagonism instead of co-operation. As now organized, however, the surveyors are largely under Dr. Babcock's direction, and staffs are learning that the aim of the surveyor is to point up the areas where there can be effective improvement in conduct of practice.

Actually, most resistance and antagonism toward the commission rules result from mistaken and ill-advised actions of the hospital staff committees, especially record and tissue committees. Human nature being as it is, too many of us when placed in authority think we must browbeat and coerce. As one misguided chairman put it, "whip the doctors into line." Such methods effectively defeat the desired purposes. Likewise the mistaken thought that there must be multiplicity of forms and charts to complicate hospital records, or that nurses must be directed to spy upon doctors and file reports of supposed malfeasance and misconduct. When staff executive committees, committee chairmen, and hospital administrators are astute and understanding, they successfully obtain cooperation of staffs by tact and diplomacy and explanation, not by police methods enforced by either committees, administrators, or nursing staff. When hospital staffs understand the purpose and intent of the recommended rules, they invariably offer co-operative support. The few who fail to comprehend the importance of high standards soon learn that it pays to go along with the sincerely conscientious majority. The process is entirely democratic and commendable.

Our re-organized Committee on Hospitals is instructed to study the existing and future commission rules, interpret and disseminate them to our membership, and further, to act as a liaison to channel to the commission our thoughts on modifications for additional impetus to effective raising and maintenance of high standards of medical practice.

Fraternally yours,

A handwritten signature in cursive script, reading "Daniel A. Nelson". The signature is fluid and elegant, with a large initial "D" and a long, sweeping underline.

President

EDITORIAL COMMENT

Whither, When, and Why

During the 1957 annual meeting of the Society, there were expressions of dissatisfaction with the trend of our meetings. These complaints were heard from members of the Society, and also from several of the exhibitors. One of these exhibitors even said that he could not recommend to the company he represents that they again have an exhibit next year, since attendance and interest were so low. Quite a number of members expressed rather strong feelings about the gradual decline of our meetings during recent years.

The subjects of these complaints are not new. There have been similar rumblings for several years, and no accusing finger should be pointed at the members in any one of the cities in which our meetings have been held. It has been a "trend" (whatever that is!), and we seem to be caught up in the stream along with other organizations and the attitudes of the day.

Our meetings have been excellent ones in the past—outstanding among state meetings according to some of the exhibitors who attended others. Comparison of our programs with other state meeting programs has left the impression that we had a superior scientific program, and interest has been high among our members. What has happened to cause a change in this situation? Why are our present meetings less attractive than earlier ones?

There are three essential parts of the annual sessions of the past: the scientific program, the business meetings (House of Delegates), and fun. The "fun" element has been drawing larger numbers of participants in recent years than before. Certainly the House of Delegates has been occupying more and more time, and in more and more prominent parts of our meeting days, so a shortage of this could hardly be considered the reason for lack of interest. This leaves for consideration the scientific program, and with this we can afford to make some study.

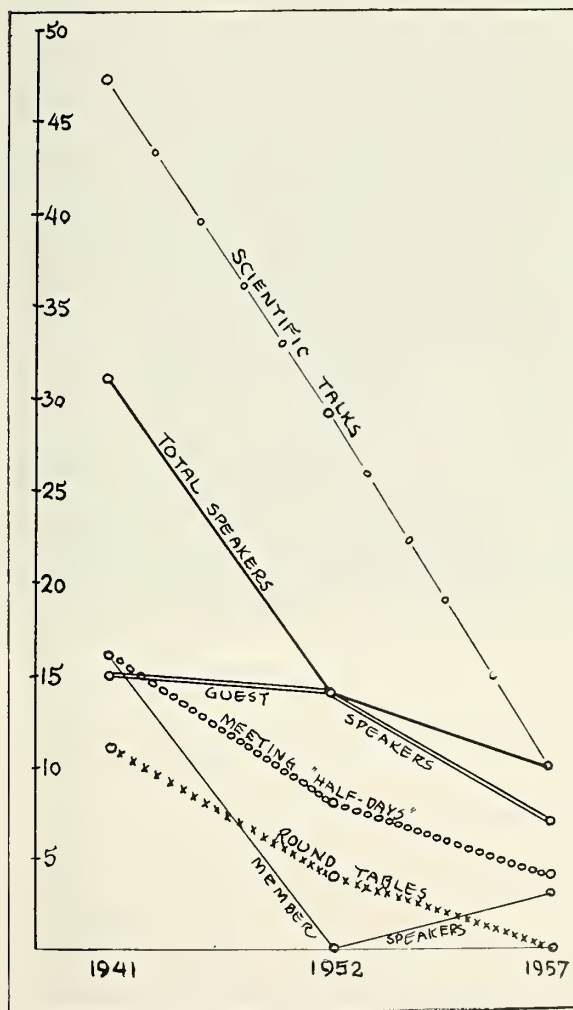
For purposes of comparison and to get an idea of changes in program policy, the programs of several representative years were studied. The years 1941, 1952, and 1957 were more or less arbitrarily selected for comparison, the first being representative of the era preceding World War II, and the two latter dates being representative of changes since World War II. The findings reveal some rather startling facts which are outlined briefly here.

In 1941 the general program occupied three full days, with three simultaneous sectional meetings during the mornings and "general sessions" during the afternoons. In addition the EENT section had its


own two-day meeting. This made a total of 16 "meeting half-days"—sectional and general. There were 47 scientific talks, given by 15 guest speakers and 16 in-state members, and there were 11 round-table luncheons—three or four each day!

In 1952 there were general sessions for two and one-half days, plus a Thursday afternoon clinical symposium at KUMC—actually still a three-day meeting. The EENT section had its meeting through two days again, but there were no other sectional meetings. There were 14 guest speakers who presented 29 scientific talks (eight of these by the two EENT speakers!). There were two round-table luncheons.

In 1957 we had 10 scientific talks (one of which was actually on a quasi-medical subject), presented by seven guest speakers and three in-state members during three general sessions. There were two panel discussions making up a fourth general session, and there was one noon-luncheon clinical pathological conference. There were no round-table luncheons,

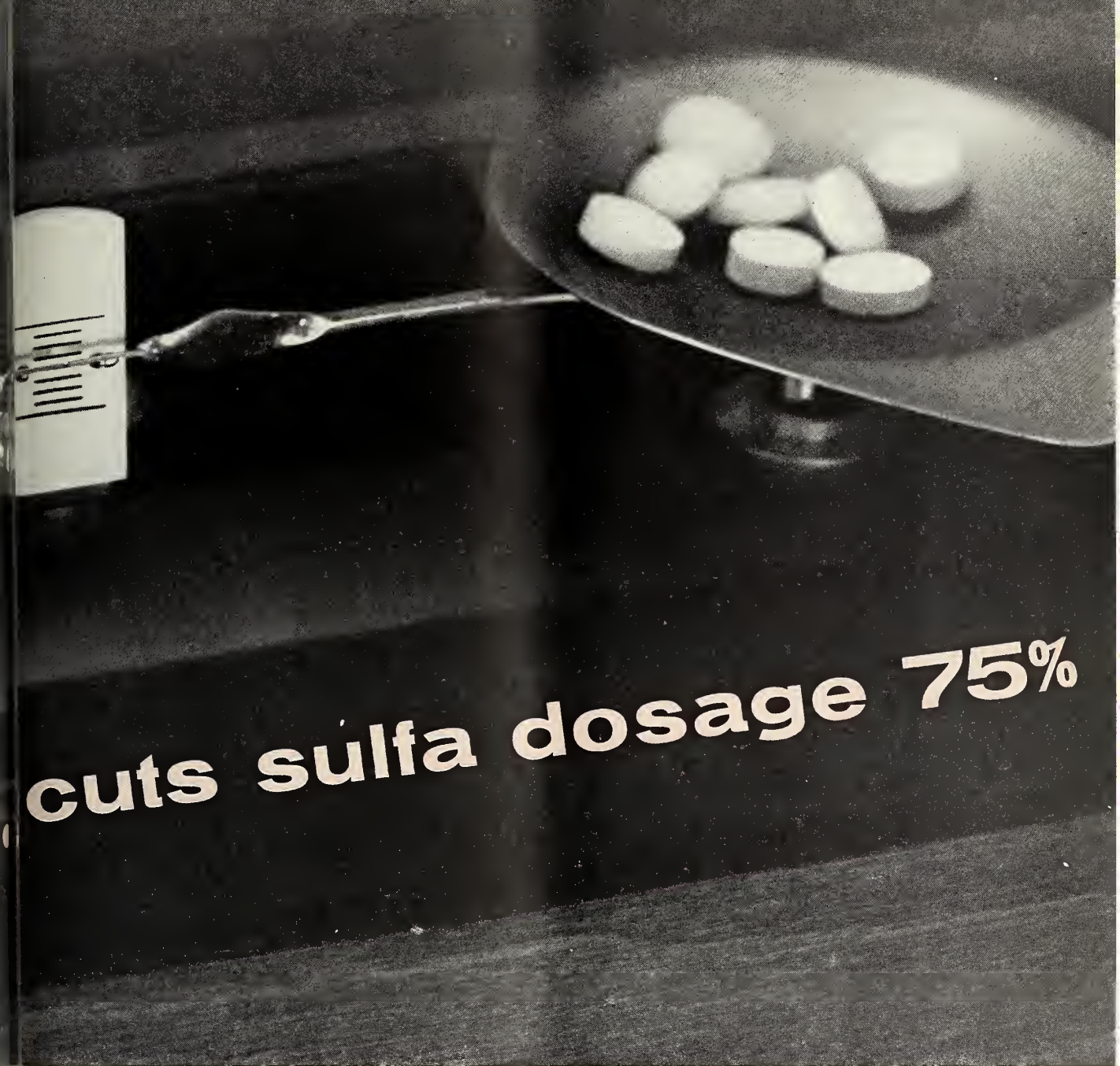


A graphic analysis of the number of scientific events at state meetings during recent years.



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1. Boger, W. P.; Strickland, C. S. and Gylfe, J. M.: *Antibiot. Med. & Clin. Ther.* 3:378 (Nov.) 1956.

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and for the first time in many years there was no EENT session. House of Delegates meetings occupied the Tuesday morning and Thursday afternoon hours which were formerly part of the scientific program.

Since impressions of the 1957 meeting are fresh in memory, some further reactions can be offered. The speakers were good and their talks were good, but there were so few of them that interest in the over-all program was never generated to a high degree. At the time that one guest speaker was to talk (he had come some 1,500 miles for the purpose), there were 19 people in the auditorium—including the speaker, the presiding officer, and the man who was to operate the projection equipment! By delaying the introduction some 15 minutes his audience had increased to 50—by actual count! As this speaker—one of the most outstanding of our guests—left the meeting place he was unaccompanied, and was obviously displeased, as he well had a right to be. In extending courtesy to one of our honored (?) guests, on this occasion we seem to have hit an all-time low. Do you think he or anyone to whom he relates his experience is likely to want to come to another of our meetings? We are not building up a good reputation by this sort of action. (Incidentally, the next speaker on the program had an audience of 35 for his excellent presentation.)

Perhaps we do not want to "go backward" to the type of meetings we had in pre-World War II days; perhaps there should be a further "progression" in the direction which is already being followed. Regardless of how one feels about this, it is strongly suggestive that there is more than a coincident relationship between less attractive meetings and less interest in the session as a whole. It strongly supports the view of most of us that a scientific program is the central core of a meeting and is the thing which creates the meeting interest and attendance. The idea still persists that doctors are more likely to congregate in large numbers for a good scientific program than they are to assemble for a golf tournament, a trap-shoot, or a lively House of Delegates meeting.

A number of excellent organizational meetings have no exhibits and prove to be well attended and enjoyed. This is true particularly of specialty organizations. The exhibits at our meetings serve a double and mutually advantageous purpose—affording us an opportunity to get information about products and equipment (while the dealers have an opportunity to advertise their products to a concentrated audience) and furnishing a significant portion of the meeting revenue. We probably want to continue to have exhibits, but if we do we will have to have an attractive meeting to get them.

Reasons for the change in policy of programs are not hard to find. In the first place it takes a great deal of work—thinking and planning, writing letters

or telephoning, committee meetings, etc.—to arrange a good scientific program. There are now many other meetings of large societies and desirable speakers are in great demand, which makes it more difficult to get them for such meetings as ours. There are these many meetings for each of us to attend, and it is easy to argue, "Why bother to make our state meeting a strong scientific meeting when so many others are available? They won't come anyway; too many meetings to attend without this one."

So, of course, the easiest way out is to put together enough of a program to "get by," but it turns out to be one which is not too stimulating and does not attract much interest of our members. The "trend" has started; on it goes, and where it leads we have discovered.

What is to be done about it? What alternatives are there? Obviously many things have changed since 1941, and the type of program which was considered a good one then may well be entirely unsuited to the present. Some other possibilities come to mind, however, and are worth at least some consideration.

Of course we can continue as we are now doing. That is the easiest way at present, but seeing where it leads, how many will be satisfied to do that? A second possibility is to eliminate altogether the scientific program, and have the annual session be only a business meeting of the House of Delegates, perhaps with a recreational meeting. Probably such a meeting would command the attendance of those delegates who accepted their responsibility and felt obligated to attend, and would attract a few enthusiastic golfers or trap-shooters who wanted to have an annual game with some confreres in other parts of the state. But does it increase any Society enthusiasm or cohesion; or make us able to treat our patients any better? Obviously not.

A third possibility which has been suggested is to completely divorce the business meeting of the House of Delegates and the scientific program—have them at different times and probably in different locations. This would eliminate conflicts so that business of the Society would receive proper and undivided attention, and the scientific program would not be competing with other features for attendance of members. It would have to be a good meeting to "stand on its own feet," but this might be a satisfactory solution.

A fourth possibility is to retrace a little and concentrate on having an exceptional scientific program without having it conflict with the House of Delegates meetings. In 1957 the House of Delegates meetings occupied the Tuesday morning and Thursday afternoon spots which formerly were devoted to scientific program. Consequently, we had only four "half-days" of program as against six during earlier

years (and there were three and four programs going on at once during some of these six half-days). It seems that our organization is not large enough to have a House of Delegates meeting coincident with a scientific program, so we should make sure that such meetings do not conflict—even if we have to have them in different months.

Some have also suggested that all the scientific program be sectional in character. This is within reason, though it would "take a little doing." The section of general practice could be sponsored by the Kansas Chapter of the American Academy of General Practice; the surgical section by the Kansas Chapter of the American College of Surgeons; sections on internal medicine, obstetrics and gynecology, orthopedic surgery, anesthesia, cardiovascular diseases, etc., each sponsored by the appropriate group within our Society. Such meetings could be going on simultaneously without producing the serious conflicts occasioned by House of Delegates meetings competing with general sessions, and might be the answer to increased interest. They would, of course, be small meetings, but would still have to be of good quality, with featured speakers, if they were to fulfill our requirement.

Perhaps we need a drastic revision of our traditional procedures for the annual session. More continuity might offer some aid, as keeping the same group (or one undergoing gradual changes) responsible for scientific programs for an indefinite number of years. The contacts of one year's efforts are often a help for the next year's program. Such gains should not be deliberately thrown away. Various other committees of the Society are relatively stable from year to year. Why not a Program Committee?

Some of the possibilities that should be considered for future meetings could not be effected without changing some of our By-Laws, but that seems to be easily accomplished if we can judge from recent meetings of the House of Delegates.

Many members would like to see this Kansas Medical Society meeting become a high point of our year—and they believe it could, with some concerted efforts.

How the Other Half Lives

Professor Edward Turner of the Massachusetts Institute of Technology, who is now devoting most of his time to the World Health Organization in the field of sanitation, recently spoke to a Kansas audience.

He tried to impress upon them the difference between the standard of living in the United States and in much of the world, especially in those countries we classify as the Orient. He tried to present a picture of the vast number of people who live under circum-

stances that appear almost unbelievable to Americans. He said:

More people live in huts of straw or mud than any other type of dwelling.

More people travel on their own feet or by burro than by any other mode of transportation.

More people have a life expectancy of half our own than greater than our own.

More mothers watch at least one-half their children die than raise to maturity all those that are born to them.

More people are born, live all their lives, and die without the help of a person with a degree of doctor of medicine than those who have medical doctors to help them.

More people eat only what they grow or catch or kill than those who eat food processed by others.

More people do not know what it means to vote than have ever voted.

One begins to ponder over what effort would be required to overcome the centuries of inertia that have settled over such populations—what force would be needed to lift them into the flow of scientific development—and who is going to do it.

Leading Causes of Death

Even though the information is not new to physicians, it might serve a purpose to occasionally record statistics on changes in the leading causes of death in the United States. The following is paraphrased from a publication of the Health Information Foundation. The figures represent the years 1900 to 1954 and include roughly, as is seen, the first half of the 20th century.

The death rate from pneumonia has declined 86 per cent during those years from a place where 12 per cent of the total deaths were from this cause to the 1954 figure of 1 per cent.

Tuberculosis declined 94 per cent. Had the 1900 death rate prevailed to this date, at least 283,000 additional persons would have died of this cause by 1954. The decline in tuberculosis deaths appears to be accelerating in spite of an apparent contrary trend in Kansas, as suggested by the recent survey by Dr. Stocklen. Nationally there were 17,000 fewer deaths from tuberculosis in 1954 than in 1950, a reduction of 50 per cent.

In 1900 diarrhea and other gastrointestinal conditions ranked third among all causes of death. Since that date the reduction is 96 per cent. Diphtheria, during the same period, has declined 99 per cent. Had the 1900 figure prevailed in 1954, there would have been about 65,000 diphtheria deaths instead of the actual 200. Bronchitis was also among the first ten causes of death in 1900 and has been reduced by

96 per cent. In 1954 the death rate from bronchitis was 2 per 100,000 population.

In 1900 the communicable diseases among the first 10 causes of death accounted for 36 per cent of the total deaths and had a combined rate of 596.5 per 100,000, while in 1954 the rate for the same diseases was 46.3. This is a reduction of 92 per cent.

Today, as is well known, the so called degenerative diseases and accidents are the major causes of death. Heart disease resulted in more than 550,000 deaths in 1954. The 1900 rate per 100,000 was 137.4. In 1954 it was 315, an increase of 129 per cent.

This one cause alone took 37 per cent of the total, which is a higher proportion than the top three causes could account for in 1900.

There were nearly 237,000 deaths from cancer in the United States in 1954, and that figure is continuing to rise. In 1900 cancer accounted for 4 per cent of the total deaths; in 1954, 16 per cent of all deaths were due to this cause.

Accidents rank fourth for the total population but are first among all causes of death for the ages 1 through 24. Accidents caused the death in 1954 of 34 per cent of all deaths in the age group of 1 through 14 and 52 per cent of the deaths in the ages 15 through 24. Beyond 25 years of age, according to this survey, the relative importance of accident mortality decreases as age increases.

The report closes with a public reminder that diseases which frequently do not cause death still require much medical care and lead to time loss and inconvenience.

"As a result, the changing patterns in causes of death bring greater responsibilities to the individual in terms of his own health. These responsibilities—a better understanding of why we should seek medical care at the time it will be of greatest value and the necessity of budgeting to meet the costs of care—are within the primary objectives of Health Information Foundation.

"Foundation research aims to increase public knowledge of health services, for example, and to stimulate the growth of voluntary health insurance. Research is also aimed at assisting the many voluntary health insurance agencies in this country in their efforts to offer broader protection against the high costs of long-term illness. It is the Foundation's hope that *Progress in Health Services* contributes to the meeting of these objectives and to more general knowledge of mortality and morbidity and their implications."—George Bugbee, President.

More than 41 per cent of the deaths and more than 35 per cent of the injuries due to motor vehicle accidents last year occurred on Saturdays and Sundays.

Colorado Tick Fever

(Continued from Page 455)

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Clinicopathological Conference

Vomiting, Anemia, Confusion, and Convulsions

Case Presentation

Our discussion for today concerns a 52-year-old white male who entered the Medical Center on January 2, 1957, with vomiting and generalized pruritus and who died on January 6, 1957.

In 1953 he developed an aching in the back of his neck. This was recurrent for the next six months. After this he developed migratory arthritis with pain, swelling, and stiffness of the toes, ankles, knees, wrists, and hands. Until December, 1955, his treatment consisted of aspirin and weekly injections of vitamins. From December, 1955, to August, 1956, he received 5 mg. of prednisone three to four times daily, and his arthritis was improved.

On August 21, 1956, he developed a severe headache with nausea, weakness, vomiting, and confusion, and he was hospitalized elsewhere on August 28. He had two convulsions that evening. During that hospitalization he was confused and irrational. Treatment was symptomatic, and his family was told he had encephalitis. He suddenly became rational after two and one-half weeks, and he was discharged. At that time capsules of vitamin D were given three times a day in place of prednisone. He improved for one week, but progressive nausea, weakness, and nervousness again developed, and vomiting and generalized pruritus occurred in December, 1956. He was given chlorpromazine and amobarbital for the nausea. He drank three or four glasses of milk and orange juice daily in the hope that it would facilitate his recovery.

The patient had been a chronic alcoholic from 16 to 44 years of age, but he had had no alcohol since 1949. In 1952 he had epigastric pain which was relieved by food and antacids, and he was told that he had an ulcer. He obtained some relief of pain with prednisone.

He was a well-developed, well-nourished, pale, white man who appeared to be chronically ill. His pulse was 80 and regular; the blood pressure was 170/95; respiration, 20. He was edentulous. A few spider nevi were noted over the upper anterior chest. The lungs were clear, and there were no cardiac murmurs. The kidneys, liver, and spleen were not

felt. There was an easily reducible right inguinal hernia and a trace of pretibial edema. There was effusion into both knees, greater on the left, with some ankle swelling and fusiform swelling of the fingers. There was some limited motion of the knees, but no pain. He was lethargic, and his memory for recent events was poor.

The specific gravity of the urine was 1.005; reaction, alkaline; 1 plus albumin; negative sugar. There were many disintegrated granular and waxy casts and pus cells. The red count was 3,120,000 with 9.0 gm. of hemoglobin. The white count was 7,150 with 61 per cent polymorphonuclears, 28 per cent lymphocytes, 40 per cent eosinophiles and 7 per cent monocytes. The platelet count was 289,000. The VDRL was non-reactive. The blood urea nitrogen was 52 mg. per cent; creatinine, 6.4 mg. per cent; uric acid, 6.1 mg. per cent; glucose, 85 mg. per cent; carbon dioxide, 28 mEq/L; sodium, 139 mEq; potassium, 4.6 mEq; chloride, 88 mEq; calcium, 6.0 mEq; phosphorus, 2.6 mEq. The serum albumin was 4.41 gm. per cent, and the globulin was 2.39 gm. per cent. A hepatogram showed a total serum bilirubin of 0.4 mg. per cent; alkaline phosphatase, 1.7 millimole units; urine urobilinogen, 0.6 mg; cephalin cholesterol, negative; thymol turbidity, 18 units; total cholesterol, 198 mg. per cent with 70 per cent esters. The serum transaminase was 9 GOT units; serum iron, 80 gamma per cent; ammonia, 80 gamma per cent; zinc turbidity, 9 units; and the 24-hour urinary calcium excretion was 5.7 mEq. Sulkowitch's test was normal. Bence Jones protein was not found in the urine. The sedimentation rate was 33 mm. in 15 minutes and 35 mm. in 60 minutes.

The patient continued to be lethargic and nauseated but showed some improvement after receiving promazine and a suspension of aluminum hydroxide with magnesium trisilicate. He took fluids well. On January 4 his intake was 5600 ml., and his urinary output was 2200 ml. On January 5 he drank 1500 ml. of water. That evening he complained of headache and nausea, and at 11:00 p.m. he had a grand mal convulsion. From 11:00 p.m. to 6:05 a.m. on January 6 he had numerous seizures which could not be controlled with intravenous amobarbital. Immediately after the last seizure he became cyanotic and died.

Dr. Mahlon Delp (moderator): Are there any questions?

Dr. William Larsen (hematologist): Was the blood pH done?

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

Dr. John Schmaus (medicine resident): No.

Dr. Larsen: Was there any brown pigmentation of the skin?

Dr. Schmaus: No.

Dr. Larsen: Had his blood pressure been high?

Dr. Schmaus: We do not know about his blood pressure before his admission here.

Dr. Larsen: Was a bone marrow examination done here?

Dr. Schmaus: No.

Charles R. Phipps (fourth year medical student):* How many times did he vomit?

Dr. Schmaus: He vomited twice on the evening of January 4, and the next day he became progressively more restless and vomited three or four times.

Irving Ringdahl (fourth year medical student): Was there evidence of recent weight loss?

Dr. Schmaus: He had lost some weight, but I do not know how much.

Mr. Ringdahl: Was an encephalogram done?

Dr. Schmaus: He had grand mal convulsions following which he became cyanotic and expired, so no electroencephalogram could be done.

Robert Pettegrew (fourth year medical student): What amount of barbiturate did he receive the night preceding his death?

Dr. Schmaus: He received 200 mg. of amobarbital at 11:00 p.m. and another 200 mg. at 2:15 a.m.

* Though a medical student in February, 1957, when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1957.

Jack D. Reese (fourth year medical student): Was a spinal puncture done?

Dr. Schmaus: The spinal fluid pressure was normal. There were no cells. The sugar was 78 mg. per cent; the chloride was 712 mg. per cent; the protein, 52 mg. per cent; the serology was negative.

Eugene G. Peterson (fourth year medical student): How much vitamin D had he taken?

Dr. Delp: Probably about 50,000 units three times a day.

Mr. Peterson: Did he have any other vitamin injection?

Dr. Schmaus: Probably B₁₂.

Mr. Phipps: Was he hypertensive?

Dr. Delp: I do not think so.

Mr. Peterson: What was his occupation?

Dr. Delp: He ran a grain elevator.

Mr. Phipps: Were there any abnormal neurological signs?

Dr. Schmaus: Nothing aside from his tremor.

Dr. Delp: May we see the electrocardiogram please.

Mr. Peterson: We have the electrocardiogram which was taken upon admission (Figure 1). The rhythm is normal, and the rate is 80. I can see no abnormality of the P-R or Q-T intervals, nor any evidence of ischemia. I interpret this as a normal electrocardiogram.

Dr. Delp: We will now have the x-rays.

Mr. Ringdahl: The chest x-ray was taken on January 2. The heart appears to be slightly enlarged, and there are increased hilar markings, but I interpret it as being essentially normal. The upper gastrointestinal x-rays were made on the same day, and there appears to be an ulcer on the greater curvature side of the duodenal bulb. The x-ray shows the shadows of the psoas muscles and the outlines of the kidneys. I

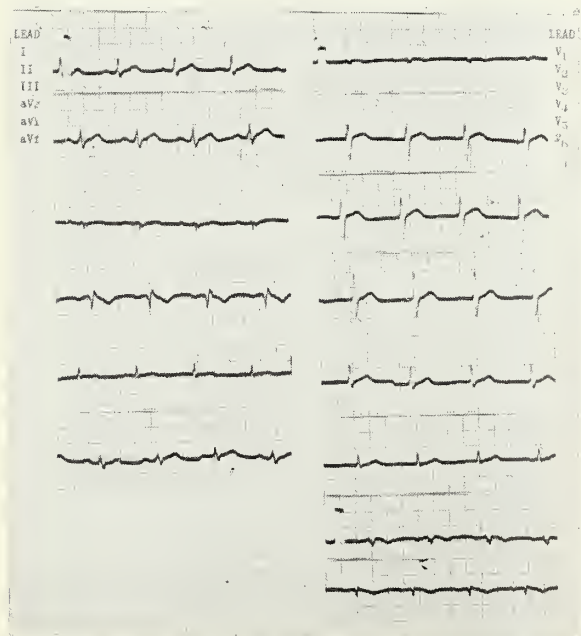


Figure 1. Electrocardiogram taken on admission.



Figure 2. X-ray film of the hands.

see no evidence of any abnormality. The film of the hands (Figure 2) shows fusiform swelling of the fingers. The x-ray of the skull is essentially normal.

Dr. Delp: Dr. Youngstrom, do you have any comments?

Dr. Karl Youngstrom (radiologist): The hands show some fibrocystic changes in the subchondral zone and in the distal end of the ulna. The teeth show some abscesses (Figure 3).

Dr. Delp: May we have the discussion, please, Mr. Phipps?

Differential Diagnosis

Mr. Phipps: The case we are discussing today is that of a 52-year-old white male who was admitted on January 2, 1957, with a complaint of generalized pruritus and vomiting. He was well until 1953 when he developed arthritis, and his treatment over two years consisted of vitamins. From December, 1955, to August, 1956, he was given prednisone with some relief. He received vitamin D three times a day for five months before his death. Four months before his admission he developed weakness, nausea, and vomiting, and he was hospitalized and treated symptomatically with temporary relief. After his dismissal his symptoms became gradually worse, and he was admitted to this hospital.

During his hospital course he was given promazine and aluminum hydroxide with magnesium trisilicate. On this regimen he improved for a time. He took fluids well. Three days before death his intake was 5600 ml., and his output was 1200 ml. On the day before death he drank approximately 1500 ml. of water. That evening he complained of headache and vomited. He then had a grand mal seizure, followed by several other seizures which were not controlled with amobarbital. Immediately following the last seizure, he became cyanotic and died.

I shall base my differential diagnosis on anemia, azotemia, and hypercalcemia. The first disease that I want to consider is sarcoidosis. This is relatively rare. Twenty to 40 per cent of these patients have hypercalcemia. The manifestations of the disease depend upon its location, which may include the kidneys. Bone lesions and skin lesions are common. Hyperglobulinemia and anemia may be present. I rule this out on the basis of the absence of adenopathy, the lack of x-ray findings, and the presence of a normal serum globulin.

Multiple myeloma is a disease which occurs most commonly after the age of 40 and is found frequently in males. Anemia is common. Characteristically the patients have severe pain from involvement of the bones and the red marrow. Kidney damage is not unusual. Hypercalcemia is found in 50 per cent of all cases. Bence Jones protein appears in about 30

per cent, and hyperglobulinemia is usually present. I rule this out because of the absence of hyperglobulinemia, Bence Jones protein, and typical bone lesions.

Primary hyperparathyroidism appears most often in middle life. About 10 per cent of the reported cases are females. Ninety per cent of the cases are intraparathyroid adenomas; the remainder are caused by parathyroid hyperplasia and carcinoma. Bone lesions are usually present, and calcific deposits in the renal tissue are common. The presenting symptoms may be those of renal insufficiency or calculi. Weakness, anorexia, vomiting, weight loss, and constipation are usually present. Urinary calcium and phosphorus are increased. The serum alkaline phosphatase is increased; bone phosphorus is decreased. I rule this out on the basis of normal alkaline phosphatase and lack of x-ray findings.

Secondary hyperparathyroidism due to chronic renal disease has to be considered. This is due to increased retention of phosphorus by the diseased kidney, with an associated high circulating calcium re-

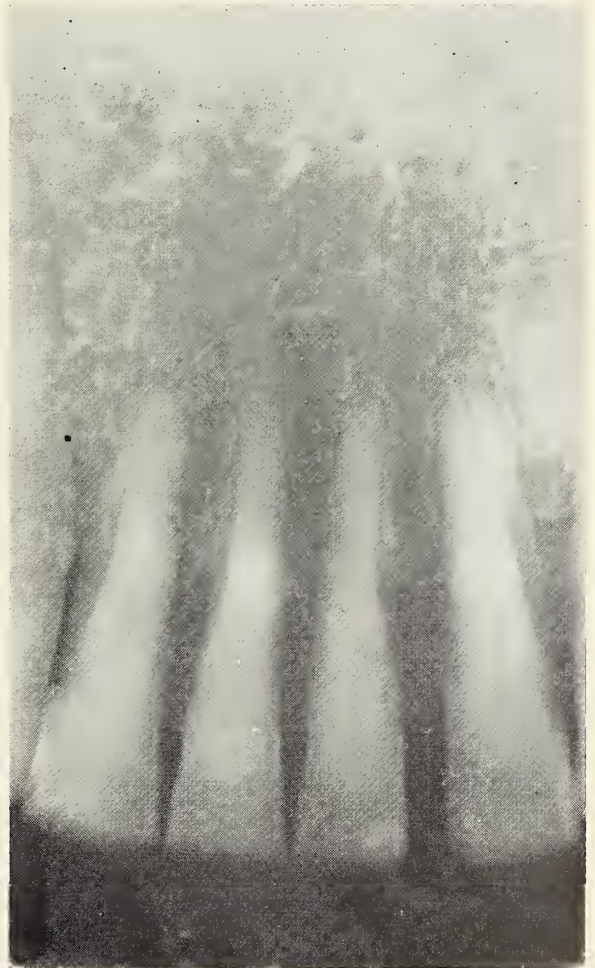


Figure 3. X-ray film of the teeth.

sulting in the stimulation of the parathyroid. Because of normal alkaline phosphatase and x-rays and the absence of initial renal disease, I rule this out.

A recent addition to hypercalcemic disturbances is Burnett's syndrome caused by the excessive intake of milk and alkali. This was first described in 1949 as milk-alkali syndrome. It is characterized by hypercalcemia without hypercalcinuria, change in the alkaline phosphatase or in the serum inorganic phosphorus. The clinical symptoms are not unlike those presented in the protocol. A history of increased and excessive intake of milk and alkali are in favor of this diagnosis. This history could not be definitely ascertained from the patient, so I cannot definitely rule this out.

The last entity to consider is hypervitaminosis D, which occurs in patients who have used the vitamin excessively and injudiciously. The symptoms are many, including the following: weakness, fatigue, weight loss, nausea, vomiting, cramps, diarrhea, headache, vertigo, depression, and psychoses. The patients have increased serum calcium and phosphorus and normal or slightly elevated alkaline phosphatase. Radiologically abnormal calcification may be observed. Renal insufficiency due to abnormal depositions of calcium in the kidneys is almost universal. Normocytic, normochromic anemia is present in various degrees in all patients who have renal involvement. The dosage required to produce this effect is calculated at about 100,000 units daily, but the development of symptoms depends not only on the dose but also on the individual susceptibility of the patient. Treatment consists of stopping the drug, low calcium diet, and high fluid intake. I believe that this patient had hypervitaminosis D. Furthermore, I believe that he had iatrogenic peptic ulcer as a result of the treatment of his arthritis with prednisone, and that he died in status epilepticus with anoxia of the vital centers and subsequent cardiac and respiratory failure.

Clinical Discussion

Dr. Delp: Thank you. Mr. Ringdahl, what is your diagnosis?

Mr. Ringdahl: Hypervitaminosis D.

Dr. Delp: Any second diagnosis?

Mr. Ringdahl: Well, it is difficult to rule out hyperparathyroidism.

Dr. Delp: Mr. Peterson?

Mr. Peterson: I was under the impression that he got into a condition of subclinical milk-alkali syndrome with nephrocalcinosis. This would make it easier for him to get hypervitaminosis D.

Dr. Delp: What about the physical findings?

Mr. Peterson: He had the familiar weakness, weight loss, and general confusion.

Dr. Delp: Any other physical findings?

Mr. Peterson: I should expect calcium deposits in

most of the viscera, probably in the subcutaneous tissues or around the knees, but these probably could not be found upon physical examination.

Dr. Delp: What about his anemia?

Mr. Reese: That can probably be explained on the basis of azotemia.

Dr. Delp: How do you explain the patients's convulsions?

Mr. Pettegrew: They could also be due to azotemia.

Dr. Delp: Mr. Phipps?

Mr. Phipps: I think that the convulsions could also be due to cerebral edema.

Dr. Delp: Mr. Reese?

Mr. Reese: I think that anoxia may have been a factor.

Dr. Delp: Mr. Ringdahl?

Mr. Ringdahl: I think they may be explained on the basis of hypercalcemia.

Dr. Delp: What about his nausea and vomiting and gastrointestinal troubles?

Mr. Ringdahl: Azotemia.

Dr. Delp: Now, you are not going to explain everything on the basis of azotemia.

Mr. Pettegrew: This may be due to the toxicity of vitamin D.

Dr. Delp: If this is such a toxic substance, how does it accomplish its toxicity?

Mr. Pettegrew: The increase in vitamin D intake may lead to increase of calcium absorption and increased serum calcium, which may induce the parathyroid gland to elaborate more parathormone. This decreases the excretion of phosphorus. The increased level of calcium and phosphorus in the blood may lead to the toxicity.

Dr. Delp: How do you explain the fact that this man told me repeatedly that his ulcer pain was relieved by taking prednisone?

Mr. Phipps: I think that his relief was probably due to his mental state, because prednisone should aggravate the ulcer.

Dr. Delp: What caused the patient's death?

Mr. Peterson: Cerebral hypoxia.

Dr. Delp: Why was he cyanotic?

Mr. Ringdahl: Because of his status epilepticus.

Dr. Delp: You know this man was walking about at 6:00 p.m. the evening before his death. At 7:30 he started vomiting. What caused his death?

Mr. Reese: Probably cerebral edema.

Dr. Delp: Dr. Rankin?

Dr. Thomas J. Rankin (internist): This man had four difficulties. He had a rheumatoid arthritis-like syndrome. We must accept his duodenal ulcer, and from his history of alcoholism and finding of spider nevi we can expect some diffuse hepatic fibrosis. He had chronic renal disease, which, from the laboratory work in the protocol, might well have been chronic pyelonephritis. The question is whether any of these

diseases had any complications which could have caused neurological symptoms and resulted in his death. Could any of his medications have caused complications which led to his neurological death, or could he have had a completely different entity? I do not believe that his hepatic disease had enough complications to lead to his death, nor do I believe that his renal disease had enough complications to do so.

We are left with the differential diagnosis of a primary rheumatoid-like disease and its complications and therapy. Hypervitaminosis D is an attractive diagnosis except that the protocol said that he had nausea, vomiting, weakness, and confusion before he received the vitamin. He was started on vitamin D about August 1, probably because they could not think of any other remedy to relieve his symptoms, and they were afraid to continue with prednisone.

I cannot explain primary disturbance of calcium metabolism by hyperparathyroidism because of the negative findings in the laboratory. A recent article³ on the treatment of rheumatoid arthritis gives the maximum safe daily maintenance dose of prednisone as 9 mg. for men, 7½ mg. for premenopausal women, and 5 mg. for postmenopausal women.

I do not like the concept of the milk-alkali syndrome, when the man's alkali was limited to non-absorbable alkali. I am attracted by another alternative; perhaps the rheumatoid-like syndrome was but a reflection of a more serious disease.

Dr. Delp: Dr. Azarnoff, do you agree with the diagnosis of hypervitaminosis D?

Dr. Daniel L. Azarnoff (resident in medicine): This man developed symptoms which might be attributed to a vitamin D excess, but vitamin D intoxication is rare. Although most people agree that one has to take about 150,000 units daily for a period of time, there was one case reported of a patient who received 100,000 units a day for two weeks and developed a fatal intoxication. If he had chronic renal disease and superimposed vitamin D intoxication, the terminal event could well be explained by the fact that he had excess fluid and developed pulmonary edema and died from that.

Dr. Delp: Dr. Wilson, can you explain this man's anemia on the basis of azotemia?

Dr. Sloan Wilson (hematologist): The degree of anemia depends upon the duration of the azotemia.

Dr. Delp: We might assume he had it for six months. Do you have any other explanation for his anemia?

Dr. Wilson: We do not know whether the man was hemolyzing or not.

Dr. Delp: Do you think that vitamin D intoxication in itself can cause anemia?

Dr. Wilson: I cannot answer that.

Dr. Delp: Dr. Christianson, what is your diagnosis?

Dr. John F. Christianson (internist): Hypervitaminosis D.

Dr. Delp: Dr. Allen?

Dr. Max Allen (internist): Cerebrovascular accident was the terminal event.

Dr. Delp: What was your diagnosis at the time, Dr. Weber?

Dr. Robert Weber (internist): My first diagnosis was multiple myeloma. I thought he probably also had vitamin D intoxication and milk-alkali syndrome. You probably wonder why the dental x-rays were shown: the lamina dura rules out hyperparathyroidism, and does leave the possibility of multiple myeloma.

Pathological Report

Dr. Chauncey G. Bly (pathologist): Although we are presenting the most plausible correlation of the findings on this patient, there are some areas in which there may be alternative interpretations.

A moderate degree of rheumatoid arthritis was noted in the fingers and knees. Although this represented the patient's primary disease process, it is of perhaps greater interest to consider the results of the treatment for this disease and the complications which contributed to his death. The most prominent of these results was the diffuse metastatic calcification of soft tissues, generally typical of the lesions following prolonged and excessive doses of vitamin D.

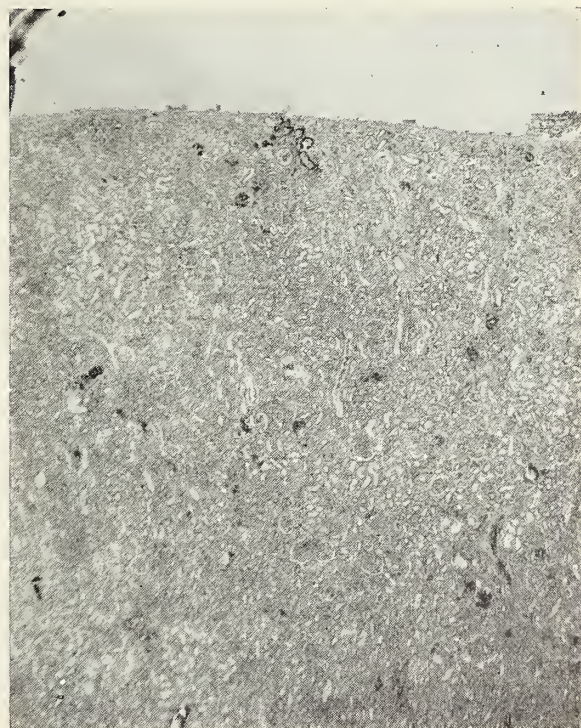


Figure 4. Nephrocalcinosis, at low power, shows widely disseminated foci of calcific precipitates in casts and tubular structures.

The kidneys weighed 360 gm. together and were grossly firm, pale, and fibrotic with an irregularly swollen cortex. A few rounded small grey-based scars grossly suggested chronic pyelonephritis. Microscopically, however, these areas of diffuse and focal chronic inflammation and fibrosis appeared to be related to numerous depositions of calcium salts. These were seen within the tubular epithelial cells, impregnating casts occluding tubular lumens, or thickly encrusting the basement membranes of arterioles or of tubules (Figures 4 and 5). As a result, the tubules showed widespread evidence of old and recent degeneration, with frequent peri-tubular fibrosis and occasional complete fibrous obliteration of the lumen. There were no grossly detectable calculi in the urinary tract.

Nephrocalcinosis is, of course, only one of the lesions possible when an excess of vitamin D upsets the normal control of the absorption, deposition, or excretion of both calcium and phosphorus by the body. The blood levels in this patient reflected this disturbance: the calcium values of 5.8-6.0 mEq/L (normal 4.5-5.5) and the phosphorus values of 2.6-2.8 mEq (normal 1.5-2.5) were elevated, tending to confirm hypervitaminosis D and to rule out both milk-alkali syndrome and hyperparathyroidism.

If a patient does not have a high level of serum globulins to solubilize the serum calcium, and our patient did not, one ordinarily expects to find soft

tissue precipitates of calcium and phosphorus whenever their solubility product exceeds 10-13, using milliequivalents, or 30-40, using mg. per 100 ml.¹ The solubility product of the levels of calcium and phosphorus in this patient was about 16, so we were not surprised to find diffuse foci of calcification of soft tissues. There were many fine, granular calcifications in the base of the aortic valve. These were surrounded by acute and chronic inflammatory tissue, implying that these were of relatively recent origin, probably within the last few months of the patient's life. There were small calcium deposits in the lung, in the walls of various small arteries throughout the body, in the pia mater, in the sheath of the optic nerve, and in the dura (which contained several larger deposits). Many of the lymph nodes, including the mesenteric and the hilar nodes, contained fibrohyaline nodules, many of which were calcified, but these probably represented old chronic inflammatory disease. The aorta, retina, and sclera were free of precipitates.

One wondered whether these abnormal soft tissue mineral deposits reflected exogenous sources or represented excessive mobilization and depletion of endogenous sources, so the bone and marrow were examined to elucidate this point. The bone cells were quiescent and disappointingly inactive, suggesting that much of the soft-tissue calcium came from the diet rather than bone. Osteoblasts were found in several areas. Osteoclasts were uncommon, however, and were not located in typical Howship's lacunae, and therefore did not suggest the existence of hyperparathyroidism, either primary or secondary. Elements of all three series of marrow cells were present in normal proportions, and we found no explanation for the patient's anemia.

The heart was moderately enlarged to 410 gm., correlating with his clinical blood pressure of 165/95, but there was only slight secondary arteriolar sclerosis in the kidney. It is conceivable that the inflammatory reaction and scarring from the nephrocalcinosis produced enough renal ischemia to initiate the hypertension.

The brain was grossly swollen and edematous, weighing 1560 gm. Microscopically, sections of the brain demonstrated occasional peri-vascular cuffing with lymphocytes and small glial nodes and foci of chronic inflammatory cells within the brain substance, often near collections of small, spherical, bluish, hyaline "atrophy bodies," usually associated with focal or diffuse cerebral atrophy. Although these findings were not pathognomonic of encephalitis several months ago, they strongly supported that clinical history. No specific etiologic agent was indicated.

The patient had a small acute and chronic duodenal ulcer, 8 mm. in diameter, which showed no bleeding point. This ulcer seemed too small to have given

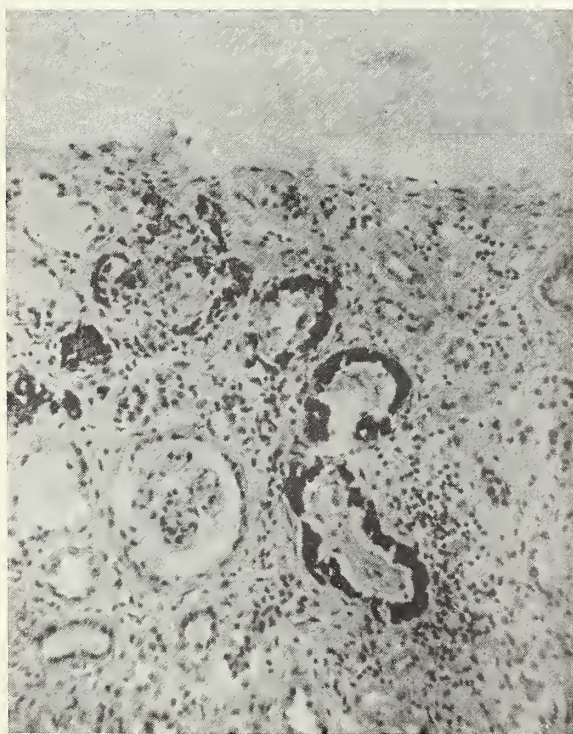


Figure 5. Nephrocalcinosis, at high power, demonstrates extensive intertubular and intratubular fibrosis and interstitial chronic inflammatory cells.

symptoms for five years, and it was not as large as many of those seen after several months of anti-inflammatory steroid therapy. Our patient's steroid therapy, however, was discontinued a few months before death. There was a small surface ulceration at the cardio-esophageal junction, beneath which there was peculiar arteriolar necrosis and extravasated blood. Most of these lesions seemed attributable to his terminal debility, uremia, and vomiting. Focal agonal hemorrhagic pancreatitis was also found but was not contributory to his death.

The lungs weighed 2270 gm. They were massively wet with diffuse edema, fibrinous uremic pneumonitis, and patches of acute hemorrhagic bronchopneumonia with massive exudates of polymorphonuclears filling small bronchi, and foci of acute terminal aspiration pneumonia with necrotizing digestion of pulmonary tissue. Numerous polymorphonuclears and bacteria in small vessels suggested the presence of a terminal bacillary septicemia with post-mortem over-growth. Small areas of fibroblastic organization of pneumonia were scattered throughout both lungs.

There were many older disease processes of isolated interest in the lungs. Scattered small, hyalinized, silico-fibrotic nodules contained doubly-retractile silicon needles, and may have been related to his work as a stonecutter 25 to 30 years before death. There were large numbers of disseminated small granulomas and fibrotic nodules containing foreign-body giant cells; because some of these contained bits of vegetable spores and debris, we were inclined to correlate them with his occupation as a grain elevator operator for the last 22 years of his life. In almost every alveolus we saw a few "dust cells" containing fine black and brownish-yellow pigment granules which correlated with his history of the consumption of nearly two packages of cigarettes a day. Finally, the almost ubiquitous Ghon complex of fibro-calcified nodules was present in the lungs and hilar nodes, although we were unable to demonstrate the organisms of either tuberculosis or histoplasmosis in the old lesions.

In summary, this patient was apparently treated with excessive amounts of vitamin D for rheumatoid arthritis. He developed nephrocalcinosis, possible renal hypertension and progressive uremia. The over-hydration which he, himself, had carried on continued in the hospital. The subsequent cerebral and pulmonary edema, and the uremia, acute bronchopneumonia, vomiting, and aspiration pneumonia with cyanosis led to his death.

Dr. Delp: I, too, think that this was a case of vitamin D intoxication. There are other comments I would like to make. First of all, I suspect that we fail to recognize vitamin D intoxication rather frequently. Next, I think that we do not recognize the fact that hypercalcemia is associated with a set of symptoms practically never mentioned in textbooks,

namely, gastrointestinal symptoms. I do not know whether the explanation is clear, but I am sure it must be the effect of the hypercalcemia on the vegetative nervous system. Finally, this patient was observed carefully for two days to see whether he was putting out enough urine, and then he was permitted to drink water in large amounts. We let him take too much water, and he developed cerebral edema. This precipitated his convulsive state, which we were not able to control. We worked ourselves into a dilemma by thinking that we could reclaim this patient.

Dr. Rankin: I would like to comment that vitamin D has no place in the management of arthritis.

Dr. Delp: We learned our lesson about vitamin D in 1939, '40 and '41. We treated osteoarthritic patients in this outpatient department with doses like this, and it did not take us long to find out that we were getting into trouble. We are extremely cautious about it now.

Summary

Dr. Delp: Nausea, vomiting, anemia, azotemia, hypercalcemia and convulsive seizures in a patient having arthritis represent a clinical syndrome which should immediately suggest the possibility of hypervitaminosis D. Quite certainly this is not a common situation, but it still occurs with a frequency sufficient to warrant caution in permitting indiscriminate self-medication with a substance quite benign when used properly.

In this instance renal failure had progressed beyond the point where water diuresis could reclaim the patient, and actually water intoxication probably precipitated the uncontrollable convulsive seizures.

Pathological Anatomical Diagnosis

Rheumatoid arthritis of fingers and knees.

Nephrocalcinosis and focal calcifications of soft tissues including the aortic valves and the pia mater.

Cardiac hypertrophy.

Arteriolonephrosclerosis, moderate.

Duodenal ulcer, acute and chronic.

Acute and organizing hemorrhagic bronchopneumonia, pleurisy, and focal acute aspiration pneumonia.

Acute and chronic massive pulmonary edema.

Possible uremic pneumonitis.

Cerebral edema, severe, and peripheral edema, slight.

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PHYSICIANS' ACTIVITIES

Dr. William J. Reals, Wichita, spoke on "The Spirit of Learning" before a meeting of the Catholic Hospital Association Council in Cleveland, May 27.

The American Urological Association announces that **Dr. M. D. McComas, Jr.**, Concordia, has been elected to membership.

Dr. Robert L. Mardock has left Wichita to establish a practice in Ouray, Colorado.

Two graduates of the University of Kansas School of Medicine who recently finished internships at Tacoma General Hospital, Tacoma, Washington, have announced plans to practice in Belleville. They are **Dr. Herbert D. Doubek** and **Dr. E. J. Chaney**.

Dr. Francis C. Newsom and **Dr. Bert E. Stofer**, Wichita, were among the speakers at the 12th annual Ministers and Physicians Clinic sponsored by Wesley Hospital and the Wichita Council of Churches recently.

Plans to move to Albany, Missouri, have been announced by **Dr. Charles M. Newman** of Axtell, who has been practicing there for more than 50 years.

Dr. Charles M. Poser, instructor in neurology at the University of Kansas Medical Center, presented a paper at a meeting of the American Neurological Association in Atlantic City on June 19. Later he went to Belgium where he addressed a meeting of the Annual Congress of Neurology in Brussels.

A preliminary program for the fall meeting of the Kansas City Southwest Clinical Society indicates that a number of members of the Kansas Medical Society will participate in panels and symposia, **Dr. William T. Sirridge**, **Dr. Albert N. Lemoine, Jr.**, **Dr. Michael J. Ryan**, **Dr. Donald L. Rose**, **Dr. Sloan J. Wilson** and **Dr. Lee H. Leger**, all of Kansas City.

Dr. Francis N. Lohrenz, Newton, recently became a diplomate of the American Board of Internal Medicine.

Six physicians were recently appointed by the Topeka Board of Education, on advice of the Shawnee

County Medical Society, to form a medical examining board for Topeka public schools, **Doctors Louis Cohen**, **Francis T. Collins**, **John E. Crary**, **Floyd C. Beelman**, **Robert H. O'Neil**, and **Don C. Wake-man**.

Dr. Murray C. Eddy, Hays, spoke on "The Doctor and the Medical Record Librarian" at a workshop sponsored by the Kansas Society of Medical Librarians in Hays last month.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was recently appointed to a five-year term on the American Medical Association Council on Medical Education and Hospitals.

Plans to begin practice in Olathe have been announced by **Dr. Robert Delphia**, a recent graduate of the University of Kansas School of Medicine who served his internship at St. Joseph's Hospital, Kansas City, Missouri.

Dr. E. Grey Dimond, of the University of Kansas Medical Center, participated in a panel discussion on coronary artery disease at a program sponsored by the Southern Illinois Heart Association in Olney last month. From June 30 through July 7 he served as visiting chief pro-tem at the Atlantic City Hospital.

Winter Veterans Administration Hospital, Topeka, has announced the appointment of a new chief surgeon, **Dr. Louis F. V. P. Vanderhorst**, formerly with the VA hospital in Altoona, Pennsylvania. Dr. Vanderhorst is a graduate of the University of Utrecht in the Netherlands. He replaces **Dr. Joseph P. Bell**, who resigned from the Winter staff to enter private practice in Las Vegas.

Dr. Ivan W. Cain, Kansas City, was elected president of the Kansas State Board of Health last month.

A talk on diet was given by **Dr. George L. Thorpe**, Wichita, chairman of the A.M.A. Section on General Practice, at the A.M.A. meeting in New York last month.

Dr. Deryl D. Fuller, Marquette, has announced plans to move to Lindsborg when a new office building is constructed there.

Dr. M. S. Carney, Manhattan, has resigned her position as city-county health director to move to California. The work in Manhattan will be taken

over by **Dr. Patricia L. Grossman** of the Student Health Department at Kansas State College.

Medical assistants of Harvey County, meeting in Newton last month, heard a talk on thoracic surgery given by **Dr. Robert G. Rate**, Halstead.

Dr. Lee F. Kramer, formerly of Cherryvale, moved to Ohio on July 1 and is now practicing in Worthington, a suburb of Columbus.

A physician in Sumner County for 54 years, **Dr. Harry L. Cobean**, was honored at a party at the courthouse in Wellington recently on the occasion of his 85th birthday. He has served as county health officer for many years.

Dr. C. J. Kurth, Wichita, was elected president of the Guild of Catholic Psychiatrists at the organization's annual meeting in Chicago in May.

The American Academy of Microbiology has invited two physicians at the University of Kansas Medical Center, **Dr. Tom R. Hamilton** and **Dr. Noble P. Sherwood**, to be charter fellows.

"Typhoid fever" was the subject discussed by **Dr. Roscoe F. Morton**, Arkansas City, at a recent meeting of the Cowley County Medical Assistants' Society.

Dr. Paul H. Lorhan, of the University of Kansas Medical Center, served as an examiner for fellowship candidates of the American College of Anesthesiology in New York last month.

Plans for a proposed hospital in Northeast Johnson County were outlined by **Dr. Donald J. Smith**, Overland Park, at a recent meeting of the Johnson County Democratic Women's Club.

Dr. Roscoe F. Morton, Arkansas City, was named president-elect of the Kansas Heart Association at a meeting held in Wichita last month. **Dr. Don C. Wakeman**, Topeka, was elected vice-president.

Last month **Dr. R. T. Nichols**, Hiawatha, observed his 55th year in the practice of medicine. A feature story in the *Hiawatha Daily World* presented his biography and a tribute to his standing in the community.

An exhibit, "Surgical Pathology of the Esophagus, Stomach, and Duodenum," was presented at the A.M.A. meeting in New York City last month by a group from the Hertzler Clinic, Halstead, **Doctors William C. Dreese, Jack W. Welch, Victor E. Chesky, Robert G. Rate, and Christian A. Hellwig.**

BLUE SHIELD

A new method of non-group enrollment which permits application for membership by individuals at any time during the year was announced last month by Kansas Blue Cross-Blue Shield.

Dr. Francis Collins, president of Blue Shield, explains that this new continuous enrollment was made available especially for people who are unable to qualify through membership where they work or through association group enrollment.

This is the first time in the history of Blue Cross-Blue Shield in Kansas that a continuous statewide enrollment has been conducted. The Blue Cross-Blue Shield program now in effect for non-group members is the one which is being offered in the new continuous enrollment. It is the method of enrollment that is different, not the program itself.

It is the hope of Kansas Blue Shield that physicians will participate in promoting the non-group program by making use of enrollment material and informational literature which will be furnished them upon request.

This continuous type enrollment is being offered as a result of an experiment on that basis conducted last year in a number of counties. In those counties, the experiment was satisfactory as well as economical and for that reason is being expanded to the entire state.

Sedgwick County Elects Officers

Officers for 1958 were elected by members of the Sedgwick County Medical Society at a meeting held in Wichita last month. **Dr. Edward S. Brinton** was named president; **Dr. Harold L. Low**, vice-president; **Dr. William H. Fritzemeier**, secretary; **Dr. Charles L. Gray**, treasurer; **Dr. Donald O. Howard**, censor for a three-year term; **Dr. Ernest W. Crow**, **Dr. Norton L. Francis**, and **Dr. William J. Reals**, to the board of directors for three-year terms.

According to Health Information Foundation, the average American incurred total charges of \$71.50 for medical care and services in 1956. In the same year, the average person covered by voluntary health insurance received benefits of \$27.

A.M.A. House of Delegates Meeting

The 106th annual meeting of the American Medical Association held in New York City, June 3 to 7, was the largest in the history of the association. Over 55,000 individuals were registered, including over 19,000 physicians. The House of Delegates considered numerous problems without getting into quite as much controversy as in the past three sessions.

The revision of the Principles of Medical Ethics was passed as modified. It is consistent with the ideas of the Kansas Medical Society so was supported by your delegates. The House discussed and adopted a "Suggested Guides to Relationships between State and County Medical Societies and the United Mine Workers of America Welfare and Retirement Fund." The basic principle behind the guide is that beneficiaries under the fund should have good medical care and should be free to select their own physicians. It advocates a fee-for-service method of payment except under unusual circumstances. In approving the guides, the House also recommended that the Board of Trustees study the feasibility and possibility of setting up similar guides for relations with other third-party groups such as management and labor union plans.

The Medicare program was discussed, and the House took these actions. It condemned payments to or on behalf of residents or interns or house officers for services while in a training program. It suggested in future contract negotiations that the type of contract and the question of whether or not a fee schedule be included should be left to individual state determination, and restated the American Medical Association contention that the Dependent Medical Care Act does not require fixed fee schedules. It also suggested that the A.M.A. attempt to have existing Medicare regulations amended to incorporate the Association's policy that the practice of anesthesiology, pathology, radiology, and physical medicine constitute the practice of medicine, and that fees for services by physicians in these specialties should be paid to the physician rendering the services.

A couple of resolutions favoring compulsory inclusion of physicians in the Federal Social Security System were introduced. These were turned down and the House re-affirmed its opposition to compulsory coverage of physicians under the Old Age and Survivors Insurance provision of the Social Security Act.

Several miscellaneous actions were considered. The House urged a more careful screening of television and radio patent medicine advertisements. It directed the Board of Trustees to investigate the indiscriminate use of stimulants such as amphetamine in relation to athletic programs. It opposed the establishment of any further veterans' facilities for the care of non-service-connected illness.

It is a pleasure to report that Dr. Clarke Wescoe was elected to the Council on Medical Education and Hospitals.

George F. Gsell, M.D.

Lucien R. Pyle, M.D., Kansas Delegates

Officers for Clinic Managers' Group

Mr. W. M. Birthelmer, of the Wichita Clinic, was named chairman of the Kansas Association of Clinic Managers at the group's annual meeting in Wichita in May. Mr. John Polson, of the Hertzler Clinic at Halstead, was elected vice-chairman, and Mr. Ramon E. Eller, with Doctors Carr and Smiley in Junction City, was chosen to serve as secretary-treasurer. During the meeting the clinic managers heard a discussion of Medicare and a talk on fee schedules. Three panel discussions, on clinic procedures, credit and control, and accounting procedures, made up the rest of the program.

Associate Director at KUMC

Mr. Russell H. Miller has been named associate director of the University of Kansas Medical Center by the board of regents, succeeding Mr. Robert A. Molgren, who resigned recently to become administrator of St. Luke's Hospital in Kansas City, Missouri. Mr. Miller joined the staff of the Medical Center in August of 1952 as assistant administrator.

Each year, colds take an estimated economic toll of \$2 billion in the United States alone. Any day in winter there are more than 20 million people suffering from a cold, according to the Kansas State Board of Health.

Gastric Acidity

(Continued from Page 445)

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

The 85th Congress is in the final few weeks of its first session with prospects that it will enact few major medical bills this year, but that next year will be a different story. On at least half a dozen important measures action has been postponed, with the understanding that the issues will be fought out in 1958.

Circumstances prevented any delay on one bill that is of considerable importance to the younger doctors—a new version of the doctor draft act. It had to be enacted by July 1, the Defense Department insisted, or not enough doctors would be available to maintain the military medical services at an acceptable level.

The problem is that the Armed Forces require a higher ratio of physicians to troops than exists between physicians and the general population. Without some special law, the services would either have to make out with fewer doctors than they say they need, or draft thousands of non-physicians merely to obtain the doctors who are in the particular age groups.

This scheme was devised: Amendment of the regular draft act to allow the call up, to age 35, of the necessary numbers of doctors from among those who had received educational deferments; they could be called because they are physicians, not because they are of a certain age. Also, the national, state and local Medical Advisory Committees of Selective Service would be continued, as would a number of provisions in the original act that protect the rights of drafted doctors.

As Congress moved toward adjournment, prospects also were that it would enact a bill to help out some states caught in a financial squeeze because of a new act, passed last year but not scheduled to go into effect until July 1, 1957, to increase federal payments for the medical care of persons on the state-federal public assistance rolls.

Under the old system, states could use the U.S. dollars to pay directly to the individuals for their medical care, or directly to the vendors of medical service—hospitals, physicians, dentists. Many states, adopting the second plan in all or part of their counties, used the federal money to help maintain pooled funds, which support various medical care programs.

All U.S. money paid out under the new act must

be used in the form of vendor payments—that is, not turned over directly to the public assistance cases. At the same time, the law as originally passed stipulated that any money received under the old plan henceforth would have to be handled as “recipient payments,” that is going directly to the persons on public assistance rolls.

A number of states thus faced the prospects of drastically revising their carefully-established medical care programs or sacrificing large amounts of federal money. Congress came to their rescue by means of a bill that would allow them to use the old money as before, yet take full advantage of the new federal program.

In the closing weeks of the session, however, two major medical bills were making little, if any progress—those for federal grants to medical colleges to build teaching facilities and for initiating a program of health insurance for federal civilian employees.

A number of bills had been introduced on aid to medical education, representing virtually all the viewpoints in Congress and the administration, but nothing much was happening. Here one factor was the economy drive, which was not too successful in cutting the administration's health budget, yet which virtually precluded any new programs involving large appropriations.

On federal employee health insurance, these longstanding differences of opinion still blocked any compromise: Should emphasis be on basic health insurance, or on major medical (catastrophic) coverage? Should U.S. payroll deductions be permitted, or would this open the door to demands for many other payroll deductions, such as for union dues? What safeguards could be set up to prevent either the commercial insurance companies or the nonprofit organizations (union plans and Blue Cross-Blue Shield) from gaining a dominant position?

On these two major bills, as well as on many others, sponsors were not too discouraged. Already they were making plans to press them still more vigorously next year when Congress, looking toward the fall elections, may be more responsive.

Doctors are asked by PHS to be on the alert for a new type A influenza strain expected to work its way into this country from the Far East. Details from state health departments.

National Library of Medicine officials were still hopeful, as the end of the session neared, that Congress would vote enough money to start constructing the library's new building next year.

Choline

A Review of Indications for Therapeutic Use

ROBERT G. GODFREY, *Kansas City*

The value of choline as an adjuvant to therapy involving human disease is a question that is as controversial as it is new. The use of choline and related substances as medicinal agents has hardly progressed beyond the experimental stage, yet there is extensive literature dealing with the subject.

It is my purpose to present some of the conflicting views on this subject and to interweave these discussions with a consideration of more firmly established experimental work on the metabolism of choline and related substances. This is done in order that the reader may more accurately evaluate the possible potential of these agents in therapeutic applications.

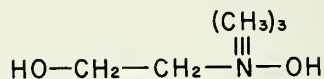
Choline was first isolated from hog bile lecithin by Strecker in 1849, but for 75 years following this nothing was made of this discovery from a physiological standpoint. It was less than 25 years ago that the work of Banting and Best on insulin led to the recognition of the production of extremely fatty livers in depancreatized dogs maintained on adequate insulin therapy.

Upon more extensive investigation, Best and Hershey⁸ found that fatty livers could be prevented by the administration of lecithin and that the active agent in lecithin was choline. This discovery, along with the finding that the ordinary albino rat was susceptible to liver steatosis produced by dietary choline deficiency, has been the basis of a vast amount of research which continues today.

The Nature and Occurrence of Choline

Choline is a quaternary base resembling ammonium hydroxide with a hydroxyethyl group replacing one hydrogen and three methyl groups replacing

three other hydrogens. The formula for choline is



In pure form it is a colorless, crystalline, highly hygroscopic compound with a bitter taste. It is readily decomposed by heat to form trimethylamine and glycerine—a fact which aids in its chemical determination. Bacteria are able to decompose choline to form neurine, a highly poisonous substance.

Choline is found in nature. It occurs in most foods, and eggs are especially high in choline content. Dry beef or pork liver contains 2.0 per cent choline, and whole grain, yeast, and peanut meal are good sources. Choline is found in nature bound as part of the phospholipid molecule. Phospholipids are active lipids found universally in all living cells. They are composed of fatty acids, an alcohol, and phosphoric acid in conjunction with a nitrogen base—either choline or some other related lipotropic substance. Examples of phospholipids are the lecithins, sphingomyelins, and cephalins. The ubiquitous nature of the phospholipids indicates their being essential for either cell metabolism or cell structure or both. Since choline is an integral part of the phospholipid molecule, to establish the need for phospholipids is to establish the need for choline.

While there is little chance of an average adult developing a deficiency of choline, the knowledge of deficiency symptoms in lower animals has led many workers to regard choline as a vitamin. King³³ feels that choline is a member of the B-vitamin group, and Sure⁴⁷ and György and Goldblatt²⁵ concur in this opinion. Best, Mawson, McHenry, and Ridout¹⁰ agree that it is an essential accessory food factor, but they hesitate to classify it as a true vitamin. McHenry³⁴ points out that according to strict definition it cannot be classified as such, for even though it does meet every qualification for a vitamin as regards its essential nature, it fails to meet the stipulation that a vitamin must be incapable of synthesis within the body.

The work of du Vigneaud and Stetten¹⁸ conclusively proved that choline can be synthesized *in vivo*, providing certain equally essential precursors are present in the diet or within the body. Superficially this may appear to be pedantic "hair-splitting"; still, the elucidation of this seemingly minor point has

This is one of a group of theses written by students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Mr. Godfrey is now a third year student at the school.

The author wishes to acknowledge the interest and attention given him by Dr. Harold Edelhoch, assistant professor of oncology and biochemistry, University of Kansas School of Medicine, who acted as advisor in the preparation of this paper; and Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, who served as reviewer of the final manuscript.

Thanks also are due to Dr. D. J. Mulford, professor of biochemistry at the University of Kansas, under whose direction and guidance the author first became interested in the problems of choline metabolism, and who was kind enough to read the preliminary manuscript and offer valuable criticisms and suggestions for its improvement.

led to the unfolding of the process by which choline is synthesized and, in so doing, has opened the way for tremendous advances in all phases of metabolism involving the transfer of labile methyl groups, i.e., transmethylation.

These workers¹⁸ using C^{14} and deuterium as tracers concluded that choline is synthesized in the body if ethanolamine and methionine are present in adequate amounts. Figure 1 shows the relationship between these substances and other related precursors and products.

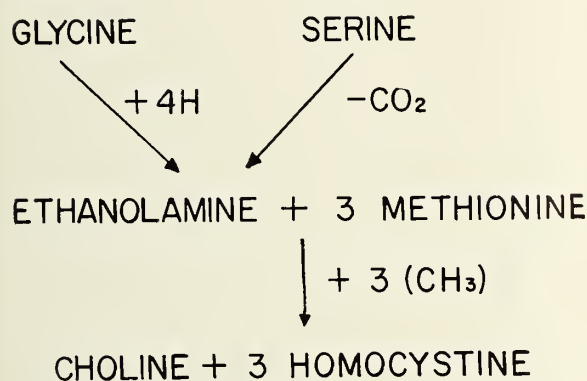


Figure 1. Synthesis of choline in vivo.¹⁸

Choline Deficiency

The rat has been the main font of knowledge concerning symptoms seen in choline deficiency. When fed a choline-deficient diet, rats show demonstrable changes within a matter of hours. Most intensively investigated has been the development of fatty livers (steatosis or fatty metamorphosis). It would appear that without choline the liver is unable to synthesize vital phospholipids or to oxidize fatty acids properly.^{7, 15} As a result, when fat is absorbed and passed on to the liver, it is rapidly stored in this organ since it can neither be transported out as phospholipid, nor can it be oxidized for energy.

McHenry³⁴ points out that there are two types of lipid which are deposited in the liver in rat choline deficiency experiments: neutral fats (glycerides) and cholesterol esters. It should be remembered that there is a great difference in the nature of these two lipid fractions, for while choline is effective in the reduction of the glyceride moiety, it shows little or no effect on the reduction of cholesterol esters.^{4, 7} Dragstedt, Prohaska, and Harms¹⁷ have discovered a component of pancreatic extract which they call "lipocaic," capable of mobilizing cholesterol esters out of the liver. They feel this substance is a hormone; however, more recent work has demonstrated a similar substance in wheat germ, and Gavin and Sinclair⁴⁴ have shown inositol (a constituent of cephalins) to produce equivalent effects.

In addition, it should be noted here that the most

recent experimental evidence indicates that there are two basic types of hepatic injury resulting from all experimental deficiency studies: first, there is fatty metamorphosis (involving either one or both of the glyceride and cholesterol fractions), and second, an overt cellular degeneration or necrosis. Daft¹⁶ recognizes these as being two separate and distinct entities. Schwartz⁴⁰ points out that substances offering protection against one often enhance the production of the other. Hence, while choline, betaine, and B₁₂ act to protect against fatty metamorphosis, they tend to enhance the production of liver necrosis. In the present discussion the primary concern shall be with the fatty metamorphosis syndrome.

In addition to liver injuries, it has been found that within six to eight days after the institution of a choline-deficient diet, rats develop what is termed by Griffith²² the "hemorrhagic renal syndrome." This condition is characterized by extensive subcapsular and cortical hemorrhagic degeneration, involving both tubules and glomeruli of the kidney. Christensen¹² also notes other pathological lesions in the rat resulting from choline deficiency which include: involution of the thymus, enlargement and congestion of the spleen, blood in the lymph node sinuses, and ocular hemorrhages. Other experiments indicate choline to be important in rats for the production of normal epithelium⁴³ and lactation.⁴⁷ It is also effective in the prevention of perosis or "slipped-tendon" in chickens.³¹ Choline deficiency manifestations have also been observed in dogs, rabbits, mice, and rhesus monkeys as well as in certain bacteria.

The exact meaning and importance of these many diversified findings have not been thoroughly interpreted; in fact, some have not even been speculated upon to any great extent. Still, choline has been implicated in every phase of metabolism including that of carbohydrate and protein³¹ as well as fat. In addition, there are certain relationships between choline metabolism and the body's endocrine balance,¹¹ vitamin complement,^{23, 34} mineral components,² general level of nutrition,⁴⁵ and even its environmental status.⁴² Although the nature of these relationships is not all clear, it may be concluded with Griffith²² that choline is essential not only for normal fat metabolism but also for tissue maintenance and animal survival as well.

It is readily seen that somewhere amidst this maze of findings there quite reasonably might be some correlation with disease states in man presenting similar symptomatology. Should this be the case, it is not unreasonable to assume that some of these conditions might respond to choline therapy. In this respect, however, it is imperative that it be remembered that, because a bird will fly if thrown from a tall building, it does not necessarily follow that the same will hold true for a human subjected to the

same treatment. While analogies with experimental animals are valuable tools of research, we must always regard them with reservations awaiting final proof of their validity.

Lipotropic Action

Hepatic injuries. The development of fatty livers in human disease is not an uncommon occurrence. The normal mammalian liver contains about 5 per cent lipid; however, under pathological conditions, the level may rise as high as 20 to 30 per cent. In the human such livers are often seen in prolonged passive congestion, syphilis, alcoholism, and prolonged malarial fever. All these conditions are associated with cirrhosis of the liver concomitant with fatty metamorphosis. Poisonings due to carbon tetrachloride, phosphorus, arsenicals, chloroform, sulfonamides, and lead, as well as diabetes, yellow fever, eclampsia, hyperthyroidism, viral hepatitis, dietary deficiencies, severe burns, and carbohydrate deprivation, all cause cellular degeneration and necrosis subsequent to fatty metamorphosis. As McHenry puts it, "Any condition or agent which interferes with phospholipid turnover in the liver, interferes with fat metabolism and tends to cause accumulation of neutral fat and cholesterol esters."

A condition in man closely resembling prolonged experimental choline deficiency is diffuse nodular (Laennec's) cirrhosis of the liver. Choline has been tried both experimentally^{25, 39} and clinically^{15, 24} in

the treatment of this pathological state; however, the complex etiology of cirrhosis makes comparison difficult, if not impossible. The results, therefore, have been variable. Although a certain degree of improvement has been observed by some workers,^{15, 24} generally it has been found³¹ that choline has little effect on cirrhosis once the disease has become well established. This is not surprising when one considers the nature of the disorder with its cellular destruction and fibrosis. As Jukes³¹ concludes in his excellent review, once the liver has become shrunken and fibrotic, there is little chance of reversal towards normal. He goes on to say, however, that in spite of this discouraging note, choline or equivalent lipotropic therapy is often of value in supportive treatment of cirrhosis, for it has been found that choline may aid in lessening the progression of the disease or, once regression is established, hasten its resolution.

It is extremely interesting to note the striking resemblance between Laennec's cirrhosis and kwashiorkor (African protein deficiency disease). Daft¹⁶ suggests that these diseases may be one and the same since dietary deficiencies appear to represent a common etiology for both. If this is true, kwashiorkor may be a relatively common dietary disease of worldwide distribution.

Choline deficiency may be related to still other hepatic disorders; some of these are summarized in Table I. These examples, again, supply evidence of the two basic types of liver injury, viz., fatty meta-

TABLE I
EFFECTS OF CHOLINE IN EXPERIMENTAL AND CLINICAL HEPATIC DISORDERS

| LIVER DISORDER | TYPE OF INJURY | | RESULTS OF CHOLINE THERAPY | |
|--------------------------|---------------------|-------------|----------------------------|----------------|
| | FATTY METAMORPHOSIS | NECROSIS | EXPERIMENTAL | CLINICAL |
| <u>CIRRHOSIS</u> | | | | |
| Laennec's or "Alcoholic" | +++ (early) | ++++ (late) | ++ (early) | + (early) |
| Syphilitic | ± | ++++ | — | — |
| Malarial | ++ | ++++ | — | — |
| <u>HEPATITIS</u> | | | | |
| Infectious | ± | ++++ | No Exper Infection | — (3) |
| Serum | ± | ++++ | | — |
| <u>HEPATIC POISONING</u> | | | | |
| Phosphorous | ± (early) | ++++ (late) | — (9) | — |
| Carbon Tetrachloride | ± (early) | ++++ (late) | — (5) | + (1 case) (6) |
| <u>DIETARY INJURY</u> | | | | |
| Cystine Excess | ± | ++++ (40) | + | — |
| Cholesterol Excess | +++ | ++ (late) | ± | — |
| Vit. E Deficiency | ± | ++++ (46) | — | — |
| Choline Deficiency | ++++ | ++ (late) | ++++ | — |
| <u>SYSTEMIC DISEASE</u> | | | | |
| Yellow Fever | +++ | ++++ (late) | +++ (4) | — |

morphosis and cellular degeneration. There appears to be some benefit in choline therapy in cases involving the first type; however, in the second type where only cell damage is involved, there is apparently no value in the administration of choline or any other lipotropic agent. It should be remembered, though, that each type is as often as not superimposed upon the other. In such cases lipotropic therapy may prove to be of considerable supplemental value. It is interesting to note that György²⁴ has suggested that active or supportive treatment of any general hepatic injury should consist of a proper dietary balance between methionine, cystine, and choline.

Relation to circulatory disorders. Changes produced in the liver by lipotropic imbalances evoked by various causes and acted upon in varying degrees by choline have been considered at some length. It must be realized that any changes involving the lipid metabolism of the liver must ultimately be reflected by concomitant changes in the composition of the blood and serum lipids. It is also evident that changes in serum lipids may effect other changes throughout the body.

An excellent example of this is seen in the "hemorrhagic renal syndrome" as described by Griffith.²² As was previously mentioned, this syndrome presents a picture of subcapsular hemorrhagic lesions in combination with tubular and glomerular degeneration. A consideration of the time sequence involved in these lesions is of great importance. Griffith and Mulford²³ observed an acute onset after six to eight days on a choline-deficient diet. If the animal survived this phase until around the tenth day, the symptoms rapidly subsided and could not be reproduced even though the deficient diet was continued. At necropsy the kidneys of surviving rats showed no hemorrhage but were brown, scarred, and were covered with a "frosty" encrustation. Microscopic examination revealed interstitial tissue proliferation and gradual lysis of necrotic tissue. After several months most of the kidneys appeared normal; yet, mild chronic degeneration could be found on close examination. The reason for this amazing recovery is still in doubt; however, Griffith²² postulates a decrease in the requirement for choline in rats over 35 days of age.

McHenry³⁴ feels that the cause of the "hemorrhagic renal syndrome" is a failure of phospholipids to reach the kidney through the blood, thus producing cellular failure. Another explanation of much merit lies in an answer to the question of the relation of renal damage to hypertension. In 1950 Moses, Longabaugh, and George³⁶ found that if rats which had survived the "hemorrhagic renal syndrome" were placed on an adequate diet, in a matter of six months they would develop severe systemic hypertension. Hartroft²⁶ has confirmed these findings and has done

extensive work to uncover the reason for this intriguing phenomenon.

He was struck with the possibility that old latent lesions produced at the time of the acute renal episode might bear a cause-effect relationship with the resulting hypertension. He was able to demonstrate the accumulation of "fat emboli" in the capillaries of the glomeruli of the choline-deficient rats²⁷ which he attributed to the rupture of "fat cysts" in the liver. These emboli were consistently associated with lesions resembling Kimmelstiel-Wilson lesions of intercapillary glomerulosclerosis as seen in hypertensive diabetic man. He concluded that disturbances in fat metabolism and transport may be factors common to both choline-deficient rats and diabetic man. It was further suggested²⁷ that the plugging of the capillaries by the fat emboli resulted in dilation and stasis and plasma exudation (an explanation for the "hemorrhagic renal syndrome," since proteinuria but not hematuria is present.²² This stasis is thought to be responsible for an ultimate sclerosis by permitting fibrin thrombus formation to progress in its wake. Once such a sclerosis is established, the development of systemic hypertension is a constant finding.

The dietary production of hypertension is indeed a fascinating possibility, and it is interesting to note other considerations which may have some bearing on this phenomenon. Choline-deficiency renal lesions have been found to be produced only in weanling rats, 23 to 26 days of age.²² Arends and Nieweg³ have reported what they consider to be a similar syndrome in human infants. They note this condition, as with the rat, is present only in young rapidly growing infants, and they propose that it may be identical with symmetrical cortical nephrosis.⁵¹ If this is true, it would point to this syndrome as being the most common cause of renal insufficiency in infants. The implication of an association with human adult hypertension is a tempting speculation.

It follows that the exact etiology of this lesion should be determined. If it is a nutritional deficiency, as in the rat, the nature of the deficiency should be sought. In relation to this proposal, Mulford³⁸ found that the inclusion of vitamin B₁₂ in the diet of mother rats, from birth of her litter till weaning, decreased the incidence of renal lesions in choline-deficient offspring after weaning. Choline in the mother's diet did not show a comparable effect. The significance of this finding is not at all clear; however, it helps to point up the fact that the solution of this problem can lie in any number of variables, involving not only the suckling offspring but the mother and the mother's milk as well.

In the consideration of the possibility of a relationship between dietary deficiency and systemic hypertension, one is drawn to speculate on a correlation

with associated athero- and arteriosclerosis. It has been reported²⁸ that atheromatous changes similar to those seen in man are noted in rats maintained on choline-deficient diets. It has also been shown that on an adequate diet the rat is refractory to these lesions.²⁸ Steiner,⁴⁶ however, has found that choline is capable only of delaying atheromatous changes in rabbits, although it does aid in reabsorption of the plaques. In view of these and other similar findings, Wilgram, Hartroft, and Best⁵⁰ have suggested that the term lipotropic be extended to include the prevention of fat accumulation in the heart and blood vessels as well as in the liver and kidneys.

Clinical applications of choline and other lipotropics have been made in the treatment of athero- and arteriosclerosis as well as associated hypertension and congestive heart failure. It would appear that choline alone is not effective in the prevention or cure of arteriosclerosis, for Greenberg and Bruger²¹ report that no effect was observed on the concentration of blood lipids in 11 patients given 4 grams of choline per day. Goldbloom, Eiber, and Boyd²⁹ state that lipotropic combinations are equally ineffective on this condition. On the other hand, Abrahamson¹ reports great amelioration of symptoms and an attendant sense of well-being accompanying the administration of Methischol® (methionine, inositol, and choline) in the treatment of 86 patients with varying degrees of arteriosclerosis.

Morrison³⁵ is enthusiastic in his report of complete absence of deaths over a period of one year in a group of 40 patients with proved coronary arteriosclerosis and myocardial infarctions, who were treated with a combination of betaine, choline, liver fraction, and vitamin B₁₂. These results were contrasted by ten deaths in a comparable control group. He also found beneficial effects were increased by a high-protein and low-fat diet and that patients given this combined treatment showed a reduction of anginal attacks, lower susceptibility to dyspnea on exertion, ability to do more physical and mental work, a sense of well-being, and an increased appetite. It is his conclusion that lipotropic agents given in combination exert a marked synergistic effect on each other. It must be remembered, however, that with such heterogeneous mixtures, unknown factors of all sorts could be responsible for the noted effects. With this in mind, judgment of the agents reported must be reserved.

Along this same line there have been reports of choline influencing anemias in both animals and man. Davis is reported by Jukes³¹ to have found choline to be related to the production of anemia in dogs; however, Jukes cites evidence indirectly showing that in man, in certain cases of macrocytic and pernicious anemia, the opposite may be true, i.e., choline may effect a cure.

In a consideration of effects on anemic states, it is perhaps worthwhile to include that it has been found³² that choline either increases absorption of copper or limits its excretion in rats. It is known that traces of copper are essential for normal hemoglobin formation in man; this fact may, in part, explain how choline could possibly have some effect on certain anemias.

Also related to low phospholipid production and subsequent low serum phospholipid levels is a tendency toward the development of rheumatic fever. It is said⁴⁸ that resistance to this disease depends in a large degree upon serum inhibition of streptolysin-S, and that the serum inhibition depends on the level of phospholipids.

Action in Transmethylation

The relationships between the lipotropic action of choline and various bodily disorders have had many ramifications, for it is in this area of fat metabolism that most of the work to date has been done. It is evident that the process of transmethylation, as it is related to choline metabolism, can by no means be completely divorced from the lipotropic phenomenon; however, some degree of independence does appear to exist, and this problem is discussed under a separate section.

Because of the relative newness of the concept of transmethylation and the inherent difficulty in demonstrating this process experimentally, we are handicapped by having a comparatively small fund of knowledge from which to draw. In spite of this, ample evidence is available to convince one of the importance of this process. The need for labile methyl groups for the synthesis of choline and methionine has already been established. In addition, du Vigneaud¹⁸ has shown labile methyl groups—ordinarily from methionine—are active in creatine and creatinine production as shown in Figure 2.

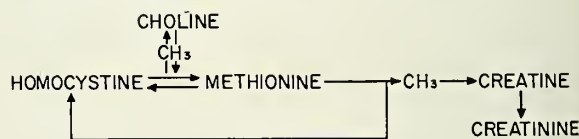


Figure 2. Transmethylation in the synthesis of creatine.¹⁸

Methyl groups are also required for production of epinephrine, trigonelline, cystine, and cysteine (by demethylation of methionine), N'-methyl nicotinamide, acetylcholine, as well as for certain detoxication reactions such as methylation of amines.

There can be no doubt that deficiencies of labile methyl groups will result in metabolic disturbances. It is felt¹⁸ that pellagra may represent such a disease, since it is known that diets low in the B-vitamins are also low in choline, for choline is found naturally in conjunction with these vitamins.

The association of labile methyl groups and creatine and creatinine formation suggests a possible link between this mechanism and the experimental production of muscular dystrophy in rabbits as seen by Hove and Copeland.³⁰ These workers have produced characteristic lesions of muscular dystrophy by maintaining the animals on a choline-deficient diet. They found that creatine excretion was increased, while excretion of creatinine was decreased. Choline therapy brought about a rapid cure. It was established that these lesions were not due to vitamin E deficiency.

Conditions of Uncertain Relationship

An attempt has been made to correlate various metabolic phenomena with the two main physiological roles of choline, viz., its lipotropic activity and its action in transmethylation. There remain yet a few findings which defy even this broad classification, resulting from either an unexplained interplay of both actions or from some other undiscovered action.

Heller²⁹ has found that choline has an apparent stimulating effect on the reticulo-endothelial system. A clear interpretation of this observation is impossible at present, but in a somewhat similar vein Jukes³¹ reports Chevremont as having found choline to be necessary for histiocyte formation. It may be that the application of these findings could lie in some aspect of radiation medicine, for it is well known that excessive radiation results in cellular damage.

Another interesting though puzzling action of choline is seen in its ability (in the carbamyl- form) to improve dark adaptability and produce a lowered light threshold in man.¹⁹ It is believed that this action is due to an increased rate of regeneration of visual purple, although the nature of this process is unknown.

One final application remains to be made, viz., the high incidence of cancer in choline-deficient animals. Copeland and Salmon¹⁴ first noted the occurrence of neoplasms in 58 per cent of animals on a choline-deficient diet over an extended period of time. No cancers were found in a similar group of control animals on an adequate diet. Since this observation, these results have been confirmed and much new information has been added. Cook and Kennaway¹³ found that the sequence of choline-deficiency carcinoma closely resembled cancer produced by carcinogenic hydrocarbons. They point out that some diets reported in the literature as being used for carcinogenic studies have been deficient in choline and methionine. In addition, Maisin et al., Nakahara, Mori, and Fujiwara are reported by Cook and Kennaway¹³ to have shown the presence of an "unknown anti-carcinogenic factor" in brain, liver, thymus, bone marrow, yeast, and whole rye flour. It requires but

little imagination to suppose this substance might possibly be choline; however, there are many other known and probably many unknown factors in these materials, and caution should be exercised in such bold speculation. In any case, there appears to be some definite correlation between cancer and choline-deficiency. The establishment of a nutritional cause for cancer could lead to many additional advances in this field.

Summary and Conclusions

An attempt is made to review briefly the early work from which evolved the nature, physiological importance, and metabolic functions of choline. For purposes of discussion, experimental findings are arbitrarily divided into those involving the lipotropic activity of choline and those related to its action in transmethylation. Some diseases of man are correlated with these activities, in order to assess the value of actual or theoretical therapeutic applications of choline in the treatment of these diseases.

It is concluded that:

1. Choline is a valuable supplemental therapeutic agent in the treatment of general hepatic injury, especially in conditions involving extensive fatty infiltration of the liver.
2. Choline is of little or no value in the treatment of conditions involving extensive degenerative necrosis of liver cells.
3. A relationship may exist between infant choline deficiency and adult systemic hypertension.
4. Choline in combination with other lipotropic agents is moderately effective in the relief of symptoms and in the production of general improvement in some cases of arteriosclerosis and related circulatory disorders.
5. The effects of choline on the reticulo-endothelial system, the visual purple of the eye, and in the prevention of certain types of experimental cancer, seem to indicate unexplained facets still exist in the metabolism of choline.

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Federal Tax Information

A film on federal taxes, "Clinic on Federal Finances," has been made by the Tax Foundation, 30 Rockefeller Plaza, New York 20, New York, and is available for showing to taxpayer, farm, employee, and other groups under local sponsorship.

It tells a story in charts, tables, and quotations from national fiscal leaders about the growth of U. S. expenditures, the problem of controlling debt and inflation, and the present tax burden. The film, in color, runs about 30 minutes.

Official Proceedings

Report of Two Meetings of the House of Delegates, May 7, 1957 and May 9, 1957

First Meeting

The first 1957 meeting of the House of Delegates of the Kansas Medical Society was held on Tuesday morning, May 7, at the Allis Hotel, Wichita, following a 7:30 breakfast. Dr. Clyde W. Miller, Wichita, president, presided.

The presence of a quorum was announced by Dr. A. W. Fegtly, Wichita, sergeant at arms, who reported the attendance of 72 delegates, 3 past presidents, 7 officers, 12 councilors, and 6 guests.

Dr. Miller introduced and thanked Dr. William J. Reals, Dr. Norton L. Francis, and Dr. E. S. Brinton, all of Wichita, for their service in summarizing the reports of officers, councilors, and committee chairmen. Dr. Reals, as chairman of the group, introduced 30 resolutions from the reports, all of which were scheduled for action at the second meeting of the House.

Dr. Orville R. Clark, Topeka, chairman of the Editorial Board, gave his annual report. In the absence of the treasurer, Dr. John L. Lattimore, Topeka, Mr. Oliver E. Ebel, executive secretary, presented figures from a preliminary audit for the fiscal year ending April 30, 1957.

Dr. Cyril V. Black, Pratt, state chairman of A.M.E.F., presented an award to Dr. John F. Thurlow, Hays, for a large individual contribution and a certificate of merit to the Society, which ranked 12th among all state organizations with reference to A.M.E.F. gifts.

Six resolutions were introduced for consideration at the second meeting of the House.

Announcements by the president concluded the meeting.

Second Meeting

The second 1957 meeting of the House of Delegates of the Kansas Medical Society was held at the Allis Hotel, Wichita, after a 12:30 luncheon on Thursday, May 9.

The president, Dr. Clyde W. Miller, Wichita, began the meeting by calling on Dr. A. W. Fegtly, Wichita, sergeant at arms, for a report on attendance. Dr. Fegtly reported the registration of 72 delegates, 6 officers, 4 past presidents, 9 councilors, and 4 visitors.

The president then introduced Dr. George L. Thorpe, Wichita, who had served as chairman of the

Reference Committee which considered all business introduced at the first meeting of the House. Also on the committee were Dr. Clarence H. Benage, Pittsburg; Dr. Glenn R. Peters, Kansas City; Dr. Lloyd W. Reynolds, Hays, and Dr. Frederick E. Wrightman, Sabetha.

Dr. Thorpe, reporting for his committee, recommended referring to the Council for approval the request of the councilor from District 15 for issuance of a charter to combine physicians in Comanche, Kiowa, Clark, and Meade counties into a component organization of the Kansas Medical Society to be known as the Iroquois Medical Society. The House concurred.

Also approved by the House, on recommendation of the Reference Committee, were reports from the following committees: Allied Groups, Auxiliary, Blue Shield Fee Schedules, Blue Shield Relations, Centennial, Child Welfare, Conservation of Eyesight, Conservation of Hearing and Speech, Control of Cancer, Control of Tuberculosis, Emergency Medical Care, Endowment, General Practice Award, History, Hospital Survey, Industrial Medicine, Maternal Welfare, Medical Assistants, Medical Economics, Medical Practice Act, Medical Schools, Mental Health, Pathology, Postgraduate Study, Public Relations, Rural Health, Safety, Stormont Medical Library, and Study of Heart Disease.

Next reported were two recommendations of the Committee on Constitution and Rules which were unanimously approved: 1) that small county societies merge with neighboring small county societies to form multi-county societies of more than 20 members, and (2) that charters be issued to such newly formed multi-county societies and that replacement charters be issued to existing groups which do not now have their original charters.

A third recommendation of the Committee on Constitution and Rules, that invitations to make annual reports to the House of Delegates be extended to the presidents of such groups as the Woman's Auxiliary to the Kansas Medical Society, the Kansas Medical Assistants' Society, and Blue Shield, to the chairman of the Kansas State Board of Medical Registration and Examination, and to the dean of the University of Kansas School of Medicine, was approved with the addition of the word "MAY." This provides that such invitations MAY be issued.

Eleven amendments to the by-laws of the Society were approved with the following wording:

AMENDMENT NO. 1

By-Laws, Chapter V, Section 8.—The agenda revised to read:

1. Registration of Delegates, ex-officio members and visitors.
2. Call to order by the President.
3. Announcement of number of Delegates, ex-officio members present and registered and the presence of an official quorum.
4. Reading of the minutes of last and any special meeting.
5. Report of Reference Committee on reports printed in the JOURNAL with details of recommendations and resolutions therein requiring action by the Society.
6. Supplemental reports from committees or officers.
7. Report of Executive Secretary.
8. Report of the Treasurer.
9. Unfinished business.
10. New business and resolutions offered.
11. Address of the President (if desired).
12. Address of the President-Elect (if desired).
13. Announcements—to include time and place of Reference Committee meeting.
14. Adjournment to reconvene at second meeting.

AMENDMENT NO. 2

By-Laws, Chapter XI, Section 1a. Amend as follows:
Delete Committee of Advisory Past

| | |
|---|---------|
| Presidents | Sec. 35 |
| Delete Committee on Venereal Diseases | Sec. 34 |
| Change name of Committee on Hospital Survey to Committee on Hospitals | Sec. 21 |
| Include Committee on Anesthesiology | Sec. 38 |
| Include Committee on Gerontology | Sec. 39 |
| Include Committee on Safety | Sec. 40 |

AMENDMENT NO. 3

By-Laws, Chapter XI, Section 1b. Amend to read:
Special Reference Committee on Reports printed in the JOURNAL.

Special Reference Committees on Recommendations and Resolutions.

AMENDMENT NO. 4

By-Laws, Chapter XI, Section 3, Paragraph 1:

- (a) Line 1, delete word "special" and remove parentheses from word "temporary."

By-Laws, Chapter XI, Section 3, Paragraph 2. Amend to read:

- (b) Special Reference Committee on Reports

printed in the JOURNAL, to consist of two or more members, shall be appointed at least 30 days before each annual session. Their duties shall be to review all reports printed in the JOURNAL and prepare written report giving in detail each recommendation or resolution proposed which requires approval or disapproval of the House of Delegates. Their report merely establishes that these matters require action by the House of Delegates, and may recommend that the reports AS PRINTED, with the exception of the specific items given, be approved as published.

- (c) The Special Reference Committees on Recommendations and Resolutions, to consist of five or more, shall be appointed at each annual session. They shall meet at a designated time and place between the sessions of the House of Delegates for consideration of all recommendations and resolutions presented to the House of Delegates requiring specific action or policy of the state Society after public hearings on the same. They shall report, complete with recommendation for approval, disapproval, or adoption, in writing, their conclusions on each subject to the second or last meeting of the House of Delegates.
- (d) By-Laws, Chapter XI, Section 3, Paragraph 3. Shall be deleted.

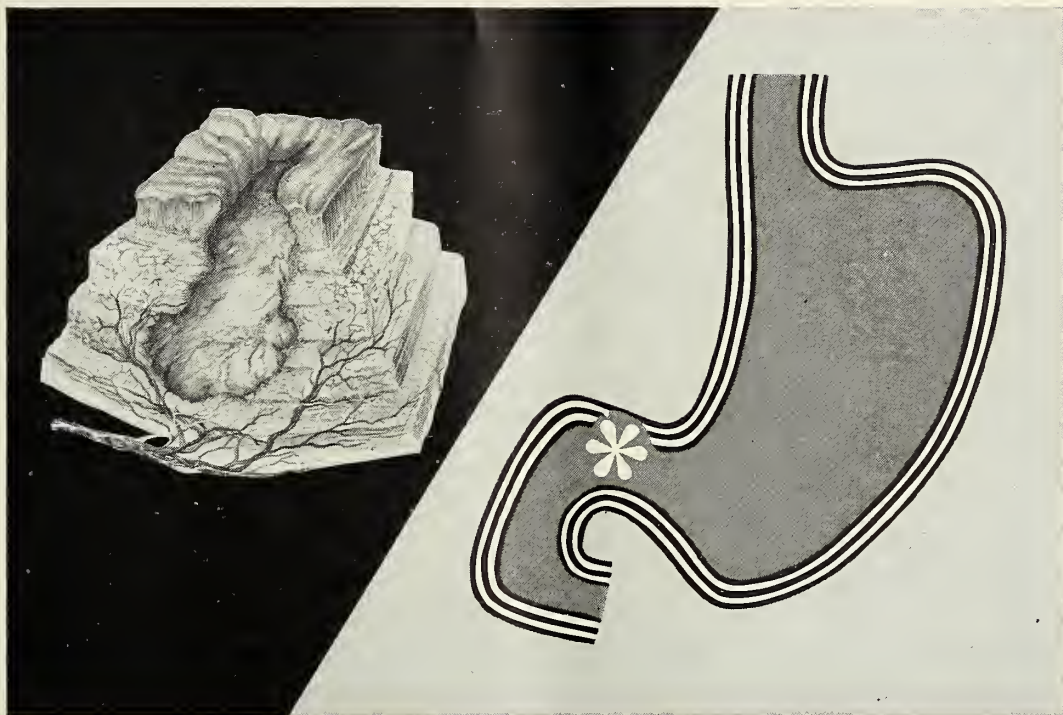
AMENDMENT NO. 5

By-Laws, Chapter V, Section 19. House of Delegates. Amend by the addition of paragraph to be No. 1:

- a. Section 19: All reports and resolutions for consideration of the House of Delegates to be published in advance of the annual session shall be sent to the executive office at least six weeks before the date of the annual session. Any supplementary reports or resolutions by individual members or component societies, to be acted upon by the House of Delegates, and not sent in time for publication, shall be written and three copies shall be sent to the Executive Office not less than five days before the annual session.
- b. Permission is requested upon the reprinting of the By-Laws to include in duties of Defense and Editorial Boards and certain officers where it has been omitted:
"Written report shall be made annually to the House of Delegates."

AMENDMENT NO. 6

By-Laws, Chapter VI, Section 3. Election of Officers. Shall be amended to read:

BROAD ANTICHOLINERGIC BLOCKADE

Pro-Banthine® Relieves Pain, Accelerates Peptic Ulcer Healing

The efficiency of Pro-Banthine (brand of propantheline bromide) in inhibiting the chemical substance which mediates parasympathetic gastric activity explains the success of the drug in ulcer therapy. Pro-Banthine blocks acetylcholine at both the ganglia and parasympathetic effector sites. This dual action controls excess neural stimulation of both gastric secretion and motility.

The therapeutic benefits of this anti-

cholinergic blockade consist, as many clinical investigators have noted, in prompt relief of ulcer pain and pronounced acceleration of ulcer healing.

The suggested initial dosage is one 15-mg. tablet with meals and two tablets at bedtime. Two or more tablets four times a day may be indicated in severe manifestations. G. D. Searle & Co., Chicago 80, Illinois. Research in the Service of Medicine.

SEARLE

Section 3. All elections of officers shall be by secret ballot unless a single candidate is nominated for office, whereupon the vote may be given viva voce. If upon any ballot for three nominees no nominee shall receive a majority vote, the nominee receiving the smallest number of votes shall be dropped and the balloting continue until a majority is obtained: Further when there are more than three nominees for an office and upon the first ballot no majority vote is obtained, all candidates having less votes than any one of the highest three shall be dropped and voting continue as outlined above for three candidates. Nominations for all offices may be made from the floor in addition to the recommendations of the Nominating Committee before balloting begins.

AMENDMENT NO. 7

By-Laws, Chapter XI, Section 30. Amend to read:

Section 30. The Committee on Public Policy shall be composed of the Executive Committee of the Council, all active Past-Presidents, and such other members as deemed advisable. Under the direction of the Council it shall represent the Society in keeping in touch with professional and public opinions and ADVOCATE legislation to secure the best possible medical results for the whole people and promote the general good of the community in local, state, and national affairs and elections. Sub-committees for special purposes may be formed. Meetings shall be held at the call of the President.

AMENDMENT NO. 8

By-Laws, Chapter XI, Section 38. Shall read:

The Committee on Anesthesiology shall consist of at least five members. It shall be the function of this committee to stimulate interest among anesthetists both full time and part time in preparing papers for publication; to study post-surgical deaths in the hospitals of the state; to encourage all anesthesiologists to participate fully in all component society meetings, with emphasis on improving the safeguards to patients requiring anesthesia, and to co-operate in furthering the purposes and the meetings of the Kansas Society of Anesthesiologists. Meetings shall be called by the chairman. At least one-half of the membership shall have served on the retiring committee.

AMENDMENT NO. 9

By-Laws, Chapter XI, Section 39. Shall read:

Section 39. The Committee on Gerontology shall be composed of five or more members appointed by the President. Its purpose shall be to study the medical, social and economic aspects of gerontology. They shall also study methods of establishing, controlling, licensing, and improving nursing homes for the care

of the aged. They shall endeavor to assist and co-operate with such departments of state government whose business it is to supervise such homes. They shall meet at the call of the Chairman. At least one-half the membership shall have served on the retiring committee.

AMENDMENT NO. 10

By-Laws, Chapter XI, Section 21. Amend to read:

Section 21. The Committee on Hospitals shall consist of five or more members, one of whom shall be the member serving on the Kansas Hospital Advisory Commission. The duties of this committee shall be to consider the problems of the hospitals of the state, co-operate with the Hospital Committee of the American Medical Association, the Kansas Hospital Advisory Commission, and the Joint Commission on Accreditation, and endeavor to secure proper rating and accreditation of hospitals and satisfactory physician-hospital relations. Meetings shall be called by the Chairman. At least one-half the membership shall have served on the retiring committee.

AMENDMENT NO. 11

By-Laws, Chapter XI, Section 40. Shall read:

Section 40. The Committee on Safety shall consist of at least five members. It shall be the duty of this committee to study the medical aspects of safety programs of all agencies, public and private, to coordinate similar studies from all sources, and to recommend and initiate such action as may be deemed necessary, advantageous, and proper for the members of the Society. At least one-half of the committee membership, one of whom is the retiring chairman, shall have served on the retiring committee. Meetings shall be called by the Chairman.

Dr. Orville R. Clark, chairman of the Committee on Necrology, read a list of Society members whose deaths were reported during the course of the past year and asked a moment of silence as a tribute to those physicians.

Dr. Thorpe next presented a resolution prepared by his committee after a review of the request of the Committee on School Health. The resolution provided that the executive secretary inform each component society by letter that it consider the appointment of a Committee on School Health in an effort to solve local problems and in addition to cooperate with the state committee and coordinate the state program. The resolution was approved.

Noting that a resolution to discontinue the Committee on Venereal Disease was included in the report of the Committee on Constitution and Rules (Amendment No. 2), Dr. Thorpe's committee recommended that the report of the Committee on Venereal Disease be tabled. The House voted to do so.

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... because among all Rauwolfia preparations Rauwiloid (alseroxylon) is maximally effective and maximally safe
 ... because least dosage adjustment is necessary ...
 because the incidence of depression is less ... because
 up to 80% of patients with mild labile hypertension and
 many with more severe forms respond to Rauwiloid alone.

A Better Tranquilizer, too

... because Rauwiloid's *nonsoporific* sedative action
 relieves anxiety in a long list of unrelated diseases
 not necessarily associated with hypertension ... without
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In moderate to severe hypertension this single-tablet combination permits long-term therapy with dependably stable response. Each tablet contains 1 mg. Rauwiloid and 3 mg. Veriloid. Initial dose, 1 tablet t.i.d., p.c.

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In severe, otherwise intractable hypertension this single-tablet combination provides smoother, less erratic response to hexamethonium. Each tablet contains 1 mg. Rauwiloid and 250 mg. hexamethonium chloride dihydrate. Initial dose, ½ tablet q.i.d.

Riker LOS ANGELES

On Dr. Thorpe's recommendation, unanimous approval was given the reports of the president of Blue Shield and the chairmen of the Committee on Dues and Hardships and the Committee on Medicare Program.

A supplementary report of the Committee on Medical Economics was next discussed. Dr. Thorpe reported his committee's recommendations as follows: that the committee be commended; that the committee obtain the broadest possible insurance coverage in a reliable company at the lowest available cost; that existing agreements with insurance carriers be terminated if improved terms can be obtained through another carrier, only after the existing carrier has been invited to meet with the Committee on Medical Economics upon the termination procedure and if there is complete assurance that no member currently insured can lose his insurance benefits because of such change. The House accepted the recommendations.

Also accepted by the House was a special report of the Committee on Relations with the Bar Association. The House acted to refer three items requiring action to the Committee on Allied Groups for implementation and adoption with the approval of the Council. The three items provide for (1) ultimate adoption of an inter-professional code of ethics between doctors and lawyers; (2) participation by doctors and lawyers in a panel discussion on inter-professional relationships at the 1958 meeting of the Kansas Medical Society, and (3) provision of speakers on the subject of inter-professional relationships for local medical societies.

The House accepted a report of the Kansas State Advisory Committee and thanked members of the committee for their services.

On the recommendation of Dr. Thorpe, the House voted thanks to members of the Shawnee County Medical Society who rendered professional services to legislators during the 1957 session of the Kansas legislature.

To carry out the recommendation of the Committee on Constitution and Rules that multi-county societies be formed, the House approved Dr. Thorpe's plan that the executive secretary prepare a report of all component societies, listing their geographical boundaries and their membership, and submit such information to the Council by October so that negotiations for the formation of multi-county societies may be begun.

Medical care for the indigent was briefly discussed. It was the recommendation of Dr. Thorpe's committee that each county society negotiate its own contract, and this view prevailed when the House voted.

Referred to the Committee on Blue Shield Relations, on a motion by Dr. Thorpe, was the matter of

establishing closer relations between the Society and Blue Shield.

Also in accordance with a motion by Dr. Thorpe, the House recommended that the president, with the consent of the Council, appoint a Special Committee on Federal Legislation to provide more information on this subject to the membership.

Dr. Thorpe next reported his committee's approval of a suggestion that a special committee be appointed to meet with representatives of other professions to work out problems that may arise from the new Medical Practice Act, and that this committee be made answerable to the Council. The House voted its approval.

The report of the constitutional secretary was then unanimously approved.

In accepting the report of the senior delegate to the A.M.A. from Kansas, Dr. Laurence S. Nelson, Sr., Salina, the House adopted a resolution praising his ability and service and directed that a letter of commendation be written him by the executive secretary. The report of the second delegate, Dr. George Gsell, Wichita, was also accepted with appreciation.

In considering the report of the president, the House accepted Dr. Thorpe's recommendations on the following points: (1) that a Kansas room be maintained for the entertainment of Kansas physicians and delegates from other states at meetings of the A.M.A.; (2) that the Committee on Medicare be continued with instructions to report to the Council on all changes and threats of changes; (3) that the Society not endorse any plan regarding polio vaccine until such time as the polio immunization program is stabilized; (4) that a vote of thanks be tendered to office employees, and (5) that it be recommended to the Council that annual Society dues for 1958 be set at \$50 per member.

The report of the president-elect, Dr. Barrett A. Nelson, Manhattan, was approved by the House. Special consideration was given his suggestion that mental health receive marked study, and the House voted to refer this study to the Committee on Mental Health with instructions that it secure Council approval for implementing the programs required. A resolution of support for Dr. Nelson's program for the coming year was passed unanimously.

Dr. Thorpe, in telling of his committee's action, asked and received approval of the report of the president of the Woman's Auxiliary to the Kansas Medical Society, Mrs. William J. Biermann, Wichita, and suggested that the report be printed in the JOURNAL. (Editor's Note. See June issue, Page 387).

The report of the executive secretary of the Kansas State Board of Health, Dr. Thomas R. Hood, was approved with an addition. The House appended to the list of bills of interest to public health workers

Meat...

and Protection Against Hypochromic Anemia

Hypochromic anemia, the most common nutritional deficiency in children in the United States, occurs most frequently in the second six months after birth.¹ A major cause of anemia in early infancy may arise from insufficient transfer of iron from the mother to the fetus,² since anemia is not uncommon in pregnant women.

A first step, then, toward prevention of hypochromic anemia in the infant is the provision of a prenatal diet rich in available iron and in high quality protein. A second and most important step is the addition of foods high in utilizable iron (egg yolk, sieved meat and vegetables) to the infant's daily diet as early as possible (usually 3 months after birth).¹

Meat contributes valuable amounts of anabolically effective protein, B vitamins, readily available iron, and other minerals to the nutrition of the pregnant and lactating woman. The feeding of sieved meat to infants after the third month provides well-utilized iron and aids in the prevention of hypochromic anemia.

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1. Jackson, P. L.: Iron Deficiency Anemia in Infants, Editorial, J.A.M.A. 160:976 (Mar. 17) 1956.
 2. Martin, E. A.: Roberts' Nutrition Work with Children, Chicago, The University of Chicago Press, 1954, p. 211.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

A m e r i c a n M e a t I n s t i t u t e
Main Office, Chicago...Members Throughout the United States

as enacted in the 1957 session of the Kansas legislature, House Bill No. 130, providing for a hospital in Northeast Johnson County, subject to the will of the people.

Also approved was the report of the Kansas State Board of Medical Registration and Examination, and commendation was given by the House to members of that board.

Next on the agenda for the House of Delegates was consideration of the six resolutions introduced at the first meeting under the heading of new business. On the recommendation of Dr. Thorpe and his committee, the following resolution introduced by Dr. Glen R. Floyd, Winfield, was approved:

WHEREAS, We the members of the Ophthalmology Section of the Kansas Medical Society have seriously studied and considered, with reference to the welfare of the public as a whole, the announcement of the American Board of Ophthalmology of its intent to establish a certification in ophthalmic surgery; and

WHEREAS, It is fundamentally the purpose and responsibility of the American Board of Ophthalmology in certifying candidates, to guarantee to the public that the certified ophthalmologist is qualified in all phases of ophthalmology and competent to assume his responsibilities in that branch of medical practice; now, therefore be it

Resolved, that it is our considered judgment that surgical certification apart from the certification in Ophthalmology has not been demonstrated to be in the interest of the public or of the profession and should not be offered for the following reasons:

1. Ophthalmic surgery is a therapeutic procedure within the practice of ophthalmology and does not constitute the basis for the establishment of a separate specialty or subspecialty.

2. If, in the opinion of some members of the Board, the competency of some diplomates is in doubt, it is the obligation of the Board to review its methods of examination and criteria for qualification, since the failure to do so would subject our Board to severe censure, and would evaluate the status of its certificate. In this regard, the acceptance of this new Board of Ophthalmic Surgery would effectively decertify all diplomates who now possess the certificate from the Board of Ophthalmology.

3. Certification by the Board is only one of the regulating mechanisms operating in medicine for the protection of the public. Certification has not given or assured prompt acceptance to the staff of any hospital. Each individual has generally been required to prove his competency before his associates at the local level. This local regulation has now been made mandatory in order that hospital officials maintain accreditation from a Commission composed of responsible members of the American College of Sur-

geons, American College of Physicians, American Hospital Association and the American Medical Association.

4. Medical Liability Insurance has become an important consideration in modern medical practice. To downgrade the innumerable competent ophthalmologists who have demonstrated their surgical ability over the years might conceivably destroy the public confidence, particularly in the smaller community, and subject such men to unjustified harassment.

5. Special recognition as an ophthalmic surgeon is already available through the American College of Surgeons, (revised qualifications) where, in addition to the listing of a large number of cases and submission of case reports, one is required to perform in his own community situation before a reviewing authority composed of recognized competent ophthalmic surgeons.

6. A change in policy of such sweeping consequences should be effected only after discussion with and consideration by all diplomates concerned.

A second resolution offered by Dr. Floyd was also approved as follows:

WHEREAS, There has been presented a Resolution, passed by the Ophthalmology Section of the Kansas Medical Society relative to the proposed establishment of a special certification by the American Board of Ophthalmology in ophthalmic surgery; and

WHEREAS, The Resolution adopted by the Ophthalmology Section of the Kansas Medical Society, a copy of which is attached hereto and made a part hereof, has been presented to this group for consideration, approval and action; and

WHEREAS, Said Resolution of the Ophthalmology Section has been given due study and consideration; and


WHEREAS, It is deemed that the position of the Ophthalmology Section is well taken; now, therefore be it

Resolved that the Resolution of the Ophthalmology Section of the Kansas Medical Society, a copy of which is attached hereto and made a part thereof, be accepted and approved. Be it further

Resolved that copies of this Resolution shall be sent to all members of the American Board of Ophthalmology, to the various state and local ophthalmological organizations, to all state medical societies, to the Section on Ophthalmology of the American Medical Association and to the American Academy of Ophthalmology and Otolaryngology.

A resolution on life insurance introduced at the first meeting of the House by Dr. Laurence S. Nelson, Jr., Salina, was approved as follows:

WHEREAS, The House of Delegates at the recommendation of the Committee on Medical Economics



NEW ACHROMYCIN^{*}V SYRUP

TETRACYCLINE BUFFERED WITH PHOSPHATE LEDERLE

**NOT
A DROP
WASTED**

Youngsters really go for the taste-true orange flavor of ACHROMYCIN V SYRUP. But this new syrup offers more than "lip-service" to your junior patients. It provides the new benefits of RAPID-ACTING, phosphate-buffered ACHROMYCIN V—

**a faster-
acting
oral
form**

- accelerated absorption in the gastrointestinal tract
- earlier, higher peaks of concentration in body tissue and fluid
- quicker control of a wide variety of infections
- unsurpassed true broad-spectrum action
- minimal side effects
- well-tolerated by patients of all ages

ACHROMYCIN V SYRUP: aqueous, ready-to-use, freely miscible. 125 mg. tetracycline per 5 cc. teaspoonful phosphate-buffered.

DOSAGE: 6-7 mg. per lb. of body weight per day.

*Reg. U. S. Pat. Off.

on May 3, 1956, approved a group life insurance plan for physicians of Kansas, and

WHEREAS, Not less than six membership letters have been sent to the membership outlining the program, and

WHEREAS, In order to put the program into effect 60 per cent of the membership or 500 members need to enroll and at the present time 250 members have applied, and

WHEREAS, Representatives of the American United Life Insurance Company are present, exhibiting at this meeting, therefore be it

Resolved, that members of the House of Delegates make every effort, at this meeting and at home, to inform the physicians of this opportunity for life insurance. Be it further

Resolved, that the time limit for enrollment be extended to June 15, 1957, and if the needed number of physicians have not applied for insurance by that date the program be cancelled and the problem referred to the Committee on Medical Economics for further study.

A resolution introduced by Dr. H. P. Jubelt, Manhattan, at the first meeting of the House was next reported by Dr. Thorpe. He said his committee approved the intent of the resolution, that different specialties of medicine be represented on the committee planning the program for each state meeting. The committee felt that the objective could be realized by directing the executive secretary to invite each specialty society to recommend a speaker for the state meeting and to submit the names of speakers so recommended to the program committee in the city in which the meeting is to be held. The House voted to follow that plan.

Also approved by the House was a resolution by Dr. Max Lake, Salina, providing for publication of an alphabetical and geographical list of members of the Kansas Medical Society, the exact contents to be decided by the Council.

The final resolution, submitted by Dr. Karl Voldeng, Wellington, for the South Central Tri-County Medical Society, related to the lack of a uniform plan for contracting for medical care of the indigent in Kansas and suggested a study of past expenditures for this purpose. Dr. Thorpe reported his committee's sympathy with the objectives of the resolution and belief in the futility of carrying out such a study. For that reason he recommended that the resolution not be passed, and the House followed his suggestion.

In concluding his part of the meeting, Dr. Thorpe thanked all who had helped the committee.

Dr. Wrightman, upon receipt of permission to introduce a resolution, asked for and received a standing vote of appreciation to Dr. Miller for his many services to the Society during his year as president.

After miscellaneous announcements, ballots were distributed for the election of officers. Dr. Orville R. Clark, Topeka, who had been one of those nominated for the office of second-vice president, asked that he not be considered for the position, and his name was withdrawn. No nominations were made from the floor, and officers were elected as reported in the June issue of the JOURNAL. Representatives of the councilor districts scheduled for the appointment of new councilors this year then reported the names of those chosen. In the final balloting five past presidents were elected to serve as members of next year's Nominating Committee, as reported in the June issue of the JOURNAL.

In accordance with a motion by Dr. Oscar W. Davidson, Kansas City, the House unanimously passed a recommendation to the Council that Dr. Orville R. Clark, Topeka, be retained as editor of the JOURNAL.

By another unanimous vote, the House expressed appreciation to the Sedgwick County Medical Society for an excellent meeting and for its hospitality.

Dr. Miller expressed thanks to the members of the two reference committees, after which he asked for suggestions for improving the format of state meetings. Several suggestions were made.

Dr. Miller then turned the gavel over to Dr. Nelson, the new president, who spoke briefly and concluded the meeting with announcement of next year's session in Kansas City.

Speeding on U. S. streets and highways last year killed 12,700 men, women, and children.

DEATH NOTICES

EARL FINLEY CLARK, M.D.

Dr. Earl F. Clark, 77, an honorary member and past president of the Tri-County Medical Society, died at the Veterans Administration Hospital in Wichita on June 2. A graduate of the University of Kansas School of Medicine, he had practiced first in Mayfield. During World War I he served in the Medical Corps of the Army, after which he did postgraduate work in ophthalmology at the University of Illinois. He began practice in Belle Plaine in 1922 and continued in practice there until his death. He had served one term as commander of the American Legion post in Belle Plaine, and in 1927 he served as a delegate to the Legion convention in Paris.

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Its well-established advantages include remarkably prompt action, broad scope of usefulness, and no tendency to development of drug tolerance. Being nonhormonal, BUTAZOLIDIN causes no upset of normal endocrine balance.

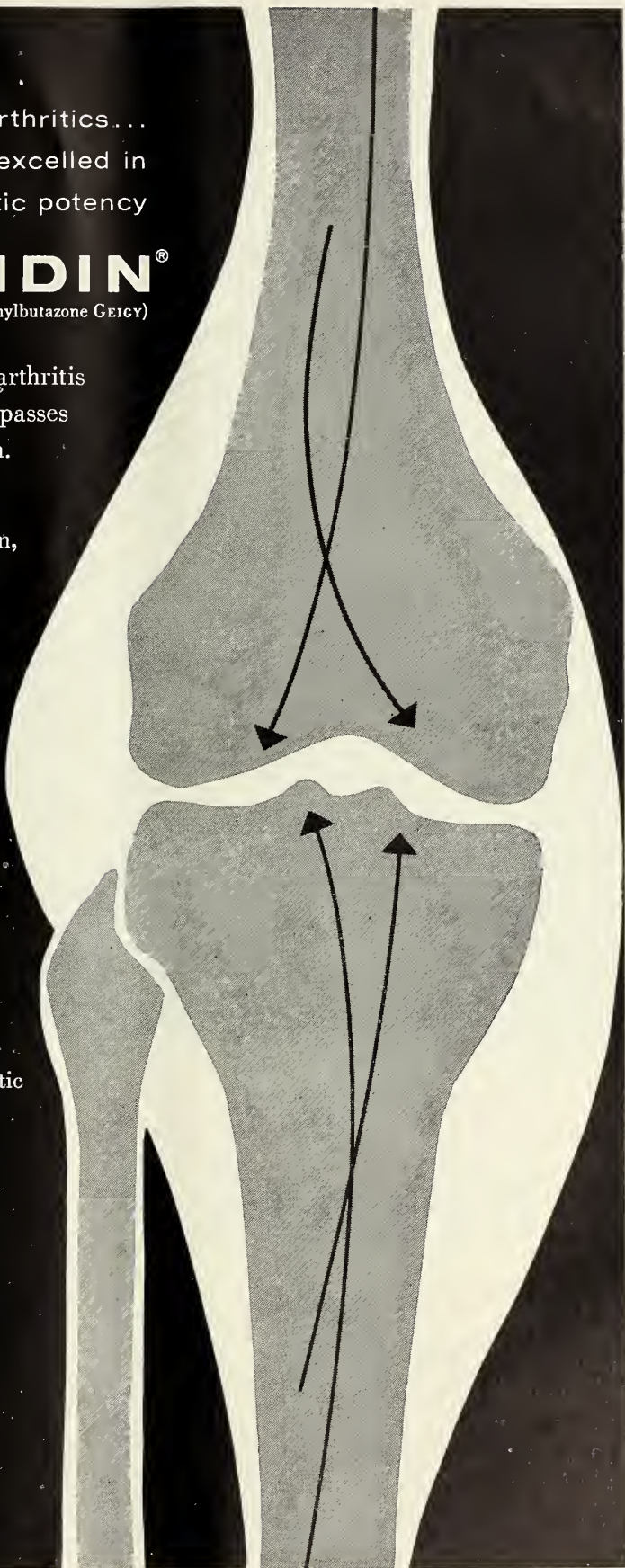
BUTAZOLIDIN relieves pain,
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Gouty Arthritis
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Rheumatoid Spondylitis
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BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for detailed literature before instituting therapy.

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BOOK REVIEWS

Principles of Urology—An Introductory Textbook to the Diseases of the Urogenital Tract. By Meredith F. Campbell, M.D. Published by W. B. Saunders Company, Philadelphia. 622 pages, 319 figures. Price \$9.50.

Dr. Meredith F. Campbell has produced an excellent first edition textbook on urology. The introduction, or Chapter I, is treated unusually by presenting a complete glossary of urological terms and definitions. It makes a study of the following chapters more easily understandable by the neophyte student.

The chapter on history-taking and examination is forcefully and clearly presented. X-ray studies are excellent and well-fitted into the diagnosis. The chapter on anatomy could be strengthened by more illustrations and annotations.

There is a splendid chapter on embryology and anomalies, but probably more detailed than the medical student needs. I like the treatment on infections and feel it is invaluable to the general practitioner and surgeon who is not a urological specialist, as well as the student. Again the treatment of the male reproductive tract could be very satisfactory for the undergraduate and truly helpful for the practitioner.

Neuro-muscular uropathy and acute trauma of the uro-genital tract is interesting and adequate. Urinary calculus disease is well discussed. The section on tumors presents thorough differential diagnosis and indications for treatment of choice. One is treated to an extra premium with a chapter on the adrenal glands and diseases. It is perhaps one of the most meaty chapters in the whole book.

This text has left out unlikely theories and controversial material and descriptions of major operative procedures. The book commends itself to the medical faculties for their text in urology and to the general practitioner or general surgeon for improvement or refreshment on the subject of urology. An unusual inclusion is a chapter of questions with page references to permit the student to examine himself on the subject covered or to help him prepare for the various state board examinations.—G.E.K.

A Textbook of Histology. By Alexander A. Maximow and William Bloom. Published by W. B. Saunders Company, Philadelphia. 628 pages, 1082 illustrations, 265 in color on 631 figures. Price \$11.

The first edition of this excellent text appeared in 1930 shortly after its senior author's death. The translation of the chapters dealing with the nervous

system in the Russian text of 1918 and extensive notes (English), especially on blood and blood-forming organs, along with those on connective tissue, formed the nucleus upon which Professor Maximow's colleagues at the University of Chicago relied in the completion of the book. Professor William Bloom has from the first been the chief author and editor, contributing chiefly the material on the biliary and respiratory systems, pancreas, and endocrine glands. Contributors and assistants are too numerous to mention in the continued editions of this exceptional treatise on the finer detailed microscopic anatomy of the human body. This phase is what makes this classic so popular.

Maximow insisted that wherever possible human material should be used. Each successive edition has maintained this, but new techniques have permitted an ever improved approach to the ultra fine structure of the human tissues, to the point where many electron micrographs enable the medical man to grasp the deeper significance of the submicroscopic world. These new vistas permit a greater understanding to the point where histology, biochemistry, and biophysics are fused into an exciting insight into nature's secrets.

Some portion of all systems of the vertebrate body has been illustrated by electron micrographs with exceptional fidelity.

As in the past, the present edition contains useful summaries of each system which deal with histogenesis and histophysiological principles. There appear here also pertinent references to recent literature.—P.G.R.

The Ciba Collection of Medical Illustrations, Volume III. Digestive System, Part III, Liver, Biliary Tract, and Pancreas. By Frank H. Netter, M.D. Commissioned and Published by Ciba Pharmaceutical Products, Inc. Price \$13.

As indicated in the title, this is Part III of a series devoted to the gastrointestinal tract. Parts I and II will follow at a later date. Utilizing to the greatest advantages the long recognized talents of Dr. Netter and complementing this with contributions of a distinguished consulting staff, the publishers have produced an amazingly lucid and useful volume.

A section illustrating and discussing anatomy of the liver, biliary tract, and pancreas is followed by sections on normal and disturbed physiology, diseases of the liver, diseases of the gallbladder and bile ducts and, finally, a section describing by illustration and text diseases of the pancreas.

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clear manner the most recent concepts of liver structure. Liver function and the "metabolic pool" are subsections so vividly and imaginatively depicted as to make much more easily understood many of the biochemist's concepts of liver activity.

All clinicians and surgeons, as well as others, will find each section—liver, biliary tract and pancreas—presenting the subject with new clarity. The text is of necessity concise and compressed, but an excellent bibliography offers quick access to an extensive literature.—*M.H.D.*

Battle for the Mind. By William Sargant. Published by Doubleday and Company, Inc., New York. 263 pages. Price \$4.50.

The common denominators of various "mind influencing" techniques are looked for by Dr. Sargant in the Pavlovian concepts of conditioned reflexes, and the effects of their disruption. Personal observations, as well as those of colleagues in World War II, contemporary historical accounts of religious conversion experiences, psychiatric treatment, both of psychotherapy and physical therapies, "brain washing" techniques, and Pavlov's animal experiments are all examined to provide data and evidence for his basic thesis.

In summary form this is that man integrates expressions, concepts, or beliefs from his environment into his behavioral and thought reflexes. The changing or alteration of these, by whatever techniques or for whatever purpose, follows a definite pattern. First strong emotional responses are aroused in some form such as tension, fears, anxiety, guilt, religious frenzy or frustration of instinctual drives which may be further accentuated by physical factors such as exhaustion. When the nervous system has been stimulated beyond its capacity to respond normally ("transmarginally"), inhibition occurs which is protective and results in altered behavior. In human thought and behavior this would result in uncertainty, in which suggestibility is increased and old behavior and thought patterns are disrupted and new concepts or beliefs can be imposed. Consideration is given to response to stress situations varying in accordance with different types of inherited temperament, as well as different patterns of response to transmarginal stimulation and inhibition.

It is felt that Dr. Sargant has made a scientific effort to bring together and explain what has been considered by many as separate or drastically different areas of human thought and behavior. The book already has been criticized or rejected by those who feel an evaluation or comparison is being made between their discipline or tenets and something seemingly diametrically opposed to it. Wesley's re-

ligious conversions are discussed along with voodoo and snake handling cults, even though Dr. Sargant makes no value judgments of the examples he chooses; he is concerned only in the *modus operandi* that makes possible any alteration in belief or behavior. Similar resentment could well come from his seeking common factors in psychoanalytic treatment and electro-convulsive therapy for mental illness; or in what might erroneously be misinterpreted as a comparison between Communistic brain washing methods and humanitarian reform movements.

If the study can be viewed scientifically, however, it is interesting and provocative reading, not only for the examples chosen but the ease with which extensions of the thesis expressed can be applied to the reader's own particular field of interest.—*J.D.*

The Riddle of Stuttering. By C. S. Bluemel, M. D. Published by Interstate Printers and Publishers, Inc. Danville, Ill. 142 pages. Price: Hard bound, \$3.50; Paper bound, \$1.50; Therapy Records, \$3.00.

This excellent book deals with therapy as much as with theory, and it should prove useful to the family doctor, the pediatrician, the psychiatrist, the speech correctionist, and the adult stutterer. Four 12-inch long-play speech therapy recordings are available. All proceeds from the sale of these books and recordings have been assigned by Dr. Bluemel to the American Speech and Hearing Foundation.

To quote Dr. Bluemel: "In the broad medical concept, the riddle of stammering involves a good deal more than speech. It involves the stammerer's personality, his native non-fluency, his environmental stresses, his disorganization in the sphere of speech, his struggle with the speech block, his conditioning experiences, and the final phase of phobia. Manifestly, the treatment of stammering requires something more than 'speech correction.' It calls for a broad psychological approach."

In the chapter on "Principles of Therapy" there are six diagrams which illustrate the process of speech learning and its progressive disruption in non-organized speech and in the various phases of disorganized speech; that is, in stuttering, in primary stammering, and in secondary stammering. Therapy is directed to the verbal thinking process. The child is helped through speech games which afford sensory—ear—training; and much effective speech therapy can be conducted in the home.

The adolescent and adult work consciously with their *inner* speech, endeavoring to establish a pattern of fluent verbal thinking. If the stutterer can learn to think quietly and clearly in words, he can "broadcast" the words to his mouth since talking is merely



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the process of thinking out loud. The techniques are described in detail.

The chapters entitled "The Speaker Himself" and "Retrospect" are rich in encouragement.—R. M-S.

Citation for Advertising Series

The American Medical Association, at its meeting in New York last month, awarded a citation to Parke, Davis and Company for "service performed to the public and to the nation through a continuing series of institutional messages published in national magazines, which accurately and dramatically tell the story of medicine and medical progress. . . . Because of these outstanding contributions to the public understanding of medicine, you have proved yourself deserving of this special recognition."

The pharmaceutical company began advertising in national magazines on behalf of the medical profession in 1928, and since that time has published 246 advertisements, most of which have dealt with socio-economic and health education topics.

This year the *Saturday Review's* advertising survey gave Parke-Davis a citation for its public service campaign in 1956, primarily dedicated to explaining the cost of medical care. The company has consulted with representatives of the American Medical Association frequently over the years in order to present advertisements which would encourage people to make full and wise use of medical services in the United States.

Committee to Combat Influenza

An advisory committee of physicians to consider precautionary steps in the United States against the current influenza epidemic in the Far East has been appointed by Dr. Leroy E. Burney, surgeon general of the Public Health Service.

The epidemics in the Far East have been caused by a new strain of influenza virus which apparently is not controlled by current influenza vaccine. It has been relatively mild, marked by a three- or four-day period of fever and other typical flu symptoms.

The Public Health Service has provided samples of the new influenza virus to manufacturers of vaccine in this country. Consultations with manufacturers will be continued during coming weeks on the possi-

bilities of producing vaccine for general distribution if this should be indicated.

Travelers from the Orient and the Philippines are advised to see private physicians if they develop a respiratory illness within 10 days after their arrival in this country. The names and addresses of passengers having respiratory illnesses when they arrive will be forwarded to health officers in the communities to which they are going.

Surgical Federations Formed

The formation of federations of surgeons on a continental basis under the aegis of the International College of Surgeons was announced recently by Dr. Max Thorek, Chicago, founder of the college. The need for such organizations developed, he said, as a result of the rapid growth of the international college since its founding in 1935 in Geneva.

Four units have been established, covering North America, Central and South America, Europe, and Asia. National sections in 40 countries will form the nuclei of the federations. Dr. Curtice Rosser of Dallas, president of the United States section and professor and head of the department of proctology, Southwestern Medical College, will be the regional secretary of the North American Federation.

The international college has sections in all of the principal countries of the world with the exception of Russia and its satellites.

Eighty-five per cent of the vehicles involved in accidents last year were passenger cars.

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Infants are not born hypersensitive but may develop hypersensitivity to foodstuffs shortly after birth. The earliest sensitizations are likely to be to milk, wheat, eggs and orange juice, with which contact is established early in life. Heredity is usually a dominant factor in the tendency of infants to develop allergy. Infants with a family history of both paternal and maternal allergy tend to develop clinical symptoms earlier than those with unilateral inheritance. Both the allergen and the symptom in the

infant may be different from those of the father or mother.

Allergic disorders of infants include gastrointestinal disturbances, infantile eczema, urticaria and asthma. Gastrointestinal allergy may be manifested by vomiting, colicky abdominal pain and diarrhea. Allergic dermatitis may be evidenced by wheal-like cutaneous reactions which may develop into exudative lesions over the scalp, face and body. A systemic food hypersensitivity may produce an asthmatic response manifested by dyspnea and wheezing, although infection is usually associated with this type of response.

Common treatments include avoidance of the allergen, desensitization, antihistaminics and, in the presence of infection, antibiotics. Infants sensitive to the proteins of cow's milk whey may be fed human, goat or mare's milk reinforced with KARO® Syrup. Casein-sensitive infants may be offered soybean milk or amino acid mixtures reinforced with KARO Syrup.

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| 2 | 15 | 13 | 3 | 4½ | 6 | 480 |
| 3 | 17 | 9 | 3 | 5 | 5 | 520 |
| 4 | 20 | 11 | 3½ | 6 | 5 | 610 |
| 5 | 23 | 11 | 4 | 6½ | 5 | 700 |
| 6 | 26 | 10 | 4 | 7 | 5 | 760 |
| 7 | 28 | 11 | 3 | 7½ | 5 | 740 |
| 8 | 30 | 11 | 2½ | 8 | 5 | 750 |
| 10 | 32 | 9 | 2 | 8 | 5 | 760 |

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|------------|-------------|-----------------------|-----------|------------|------------------|----------------------------|----------------|
| Birth | 7 | 6 | 12 | 1 | 3 | 6 | 290 |
| 1 | 8 | 8 | 16 | 2 | 4 | 6 | 395 |
| 2 | 10 | 9 | 14 | 3 | 4½ | 5 | 520 |
| 3 | 12 | 10 | 15 | 3½ | 5 | 5 | 590 |
| 4 | 14 | 12 | 18 | 4 | 6 | 5 | 695 |
| 5 | 16 | 12 | 21 | 4 | 6½ | 5 | 695 |
| 6 | 17 | 13 | 22 | 4 | 7 | 5 | 730 |
| 7 | 18 | 14 | 21 | 3 | 7 | 5 | 710 |
| 8 | 19 | 15 | 20 | 2 | 7 | 5 | 690 |
| 10 | 21 | 16 | 16 | 1 | 8 | 4 | 730 |

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|------------|----------------------|-----------|------------|------------------|----------------------------|----------------|
| Birth | 6 | 12 | 2 | 3 | 6 | 380 |
| 1 | 8 | 16 | 3 | 4 | 6 | 532 |
| 2 | 9 | 14 | 3 | 4½ | 5 | 576 |
| 3 | 10 | 15 | 3½ | 5 | 4 | 650 |
| 4 | 12 | 18 | 4 | 6 | 5 | 768 |
| 5 | 12 | 21 | 4 | 6½ | 5 | 768 |
| 6 | 13 | 22 | 4 | 7 | 5 | 768 |
| 7 | 14 | 21 | 3 | 7 | 5 | 796 |
| 8 | 15 | 20 | 2 | 7 | 5 | 780 |
| 10 | 16 | 16 | 1 | 8 | 4 | 764 |

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|------------|--------------|-----------|------------|------------------|----------------------------|----------------|
| Birth | 6 | 20 | 2 | 3 | 7 | 360 |
| 1 | 8 | 22 | 2 | 4 | 6 | 440 |
| 2 | 9 | 24 | 2½ | 4 | 6 | 510 |
| 3 | 10 | 29 | 3 | 6 | 5 | 580 |
| 4 | 12 | 33 | 3½ | 7 | 5 | 690 |
| 5 | 13 | 33 | 3½ | 7 | 5 | 730 |
| 6 | 14 | 33 | 3½ | 7 | 5 | 740 |
| 7 | 14 | 33 | 2½ | 7 | 5 | 710 |
| 8 | 15 | 33 | 2 | 7 | 5 | 720 |
| 10 | 15 | 33 | 2 | 8 | 4 | 720 |



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ABSTRACTS FROM CURRENT LITERATURE

Vascular Hemophilia

Schulman, Irving, et al.: Vascular hemophilia—a familial disease, hemorrhagic in males and females characterized by combined antihemophilic globulin deficiency and vascular abnormality, Pediatrics 18:3, 347-361 (Sept.) 1956.

A vascular basis for this disease was suggested in 1941 by McFarlane, who described morphologic and functional abnormalities of the capillaries of the nail beds in five cases. The capillaries were tortuous, distorted, and failed to constrict normally on trauma. Recently defects in prothrombin consumption have been demonstrated along with the vascular defects.

The authors present a study of four boys and three girls with vascular hemophilia. All had hemorrhagic tendency since infancy. One had an intracranial hemorrhage at birth with a slight hemiparesis. The most common bleeding manifestation in the other six children was severe and spontaneous epistaxis, requiring nasal packing and transfusions. There was excessive hemorrhage from the gums following loss of deciduous teeth or dental extractions. A history of bleeding tendency in the parents was positive in only two instances. Platelet counts, platelet morphology, prothrombin time, clot retraction, and concentrations of fibrinogen in the plasma were repeatedly and consistently normal in the seven children. The bleeding time (Duke) was prolonged in all seven. In four it was over 15 minutes and in the others it was 6 to 10 minutes. It was found that the deficient coagulation factor was antihemophilic globulin, which was shown in two ways.

Administration of fresh plasma resulted in correction of both bleeding time and coagulation defects in a patient with the combined vascular-coagulation abnormality.

Thus there are two groups under the classification of von Willebrand's syndrome, patients with vascular defect plus AHG deficiency (vascular hemophilia), and patients with vascular defect and normal coagulation status (pseudo-hemophilia).—D.R.D.

Obturator Hernia

Harper, Jack R., and Holt, James H.: Obturator hernia, Am. Jnl. Surg. 92:4, 562 (Oct.) 1956.

Obturator hernia is not common, although it is often mentioned in the differential diagnosis of symptoms referred to the lower abdomen, pelvis, and upper thigh.

The obturator foramen is nearly occluded by a dense membrane from the respective surfaces of which arise the internal and external obturator muscles. Through an opening in its upper forward aspect course the obturator vessels and nerves. The space (about 1 cm. in diameter) around these structures is normally closed by a pad of fat. When, because of emaciation or other factors, this fat is deficient or displaced, a canal is opened into which the overlying peritoneum may bulge. The female pelvis, especially in the multipara, is more prone to hernia in this area than is the male. The sac tends to lie antero-medial to the nerve and vessels.

These hernias occur mostly in women over the age of 60 years. Because of the small, hard, unyielding ring, these hernias are apt to strangulate, usually involving the small bowel, partially (Richter's type) or completely.

Diagnosis is aided by the Howship-Romberg sign. This consists of pain or paresthesia over the skin of the inner lower two-thirds of the thigh. Extension, adduction, and internal rotation of the thigh increase the pain of the hernia. In some cases a mass may be felt on the anterior pelvic wall, at the point of egress from within, by vaginal or rectal examination. This mass lies below the iliac vessels and the brim of the true pelvis.

Treatment is surgical by way of a pelvic laparot-

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omy. In order to release the hernia, it may be necessary to cut the obturator membrane in anterior-medial direction just below its insertion into the under surface of the superior ramus of the pubis. Some form of closure of the defect on its inner surface is effected, and the bowel dealt with according to its viability. An approach through the thigh is considered inadvisable because of limited access to the hernia and no access to the bowel after reduction.

The authors add two cases to those previously reported, bringing the total to 463, as of July, 1955. Resection of a gangrenous loop of ileum was necessary in one of their cases. Both recovered.—*T.P.B.*

ANNOUNCEMENTS

International Conference of Ultrasonics in Medicine, sponsored by American Institute of Ultrasonics in Medicine, Statler Hotel, Los Angeles, September 6-7. Write the Secretary, Dr. John H. Aldes, 4833 Fountain Avenue, Los Angeles 29, California.

Seventh congress of Pan-Pacific Surgical Association, Honolulu, Hawaii, November 14-22. All physicians invited. Write the secretary, Dr. F. J. Pinkerton, Room 230, Young Building, Honolulu, Hawaii.

Annual award of \$1,000 (first prize \$500, second prize \$300 and third prize \$200) offered by American Urological Association for essays on results of clinical or laboratory research in urology. Closing date December 1. Write the secretary, Dr. William P. Didusch, 1120 North Charles Street, Baltimore, Maryland.

Prize of \$350 offered by Caleb Fiske Fund of Rhode Island Medical Society for essay on "Hormonal Relationships in Breast and Prostatic Cancer—Their Practical Application." Closing date December 31. Write the secretary, 106 Francis Street, Providence 3, Rhode Island.

The American people spent more than \$11.8 billion for personal health services during 1956, Health Information Foundation reports. More than 25 per cent of this sum, or almost \$3 billion, was covered by voluntary health insurance.

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Ureteral Injury

A Complication of Pelvic Surgery Which Can Be Baffling and Serious

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There is general agreement among surgeons and gynecologists that ureteral injuries constitute one of the most serious surgical accidents with which they contend. It behooves us therefore to periodically examine the various aspects of this problem, because, as stated by Barrett:¹ "Even the most expert and experienced surgeon may find himself one day contemplating an injured ureter, no matter how wary he may be." Because of the close relationship of the distal ureter to the important pelvic structures, 75 per cent of the injuries take place in the lower one-third. Therefore, this essay will be limited to a discussion of surgical injuries involving the distal ureter.

History and Incidence

Injury to one or both ureters during operative procedures dates back to the initial days of pelvic surgery. Conger² reports that Simon in 1869 performed a cutaneous ureterostomy following ureteral injury during an ovarian operation. Twenty-six years later Tuffner reported 40 cases of ureterovaginal fistula following vaginal hysterectomy. Since the beginning of the 20th century numerous others, mostly urologists, have published papers dealing with the incidence and treatment of such injuries.

A review of the literature indicates that accidental ureteral injury occurring in the course of pelvic or radical exenterating procedures has a reported inci-

dence of one to three per cent. That the actual incidence of such injuries may be considerably higher is unquestioned for several reasons by such authors as Barrett,¹ Bland,³ Eddy,⁴ Newell,⁵ and Patton.⁶

A five-year study of 3,414 surgical procedures is reviewed with reference to ureteral injury. The literature on the subject is briefly reviewed, and two case reports are presented.

First, there appears to be a substantial number of silent unilateral ureteral injuries in which the patient suffers hydronephrotic atrophy without localizing symptoms. Another reason cited is the understandable reluctance of operating surgeons to publish reports of such complications, and since the urologist usually enters the case in the capacity of a consultant there is a disinclination to request permission to report another's complications.

A compilation of statistics from the Hospital Division of the Medical College of Virginia indicates that in the performance of 494 major gynecologic procedures on the ward service during 1950 and 1951, there were nine cases of ureteral injury, giving an incidence of 1.8 per cent. Analysis of these injuries indicates that in eight instances the ureter was divided, in two cases ligated, and in one kinked by a ligature.

Regarding the diagnosis of unsuspected ureteral injury, Hooper and Hill⁷ performed an interesting

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chromocystoscopic study on 100 patients undergoing major gynecologic surgical procedures on the ward service of the Hospital Division of the Medical College of Virginia. This consisted of performing a cystoscopic examination prior to and following surgery and observing the time of differential renal excretion for indigo carmine injected intravenously. While the procedure lacks practicability for routine employment, it was responsible for detecting three unsuspected instances of ureteral injury resulting in renal damage.

In 1953 Horrax and Conger² carried out pre- and postoperative intravenous urograms on 200 patients undergoing similar operations and found only one case of silent ureteral obstruction. On the basis of these studies, one might question the presumed high incidence of undiagnosed injuries. A more recent survey of statistics from the Hospital Division of the Medical College of Virginia reveals a total of eight injuries occurring on both the private and ward services between 1954 and 1955 in a total of 931 major gynecologic procedures, for an incidence of 0.85 per cent. An analysis of these injuries indicates five were unilateral and three bilateral; four were produced by division, three by ligation and one by kinking.

Pathogenesis

Regarding the types of surgical procedures most frequently associated with ureteral injury, the following tabulation is a composite of the experiences of Moore,⁸ Leventhal,⁹ Faulk,¹⁰ and Aschner:¹¹

- Radical hysterectomy
- Total hysterectomy (abdominal)
- Supracervical hysterectomy
- Vaginal hysterectomy
- Salpingo-oophorectomy for pelvic inflammatory disease
- Anterior colporrhaphy
- Radical operation for carcinoma of the rectum and rectosigmoid

The first four procedures account for the great majority of injuries. A study of the types of injury produced shows that some form of division accounts for most of those recognized at the time of operation, with ligation, crushing and stripping the ureter of its perureteral sheath and accompanying blood supply constituting the main causes of delayed injury. Statistically, unilateral ligation is the most frequently encountered type of surgical injury. Fortunately bilateral ligation is uncommon. Most direct injuries are said to occur in controlling hemorrhage, or incident to the removal of extensive malignant tumors, according to Barrett¹ and Newell.⁵ In urologic surgery the ureter is most susceptible to injury during the resection of large vesical diverticuli. Of the 26

papers reviewed, only Patton⁶ expressed the opinion that extensive stripping of the intact ureter is probably rarely complicated by ischemic necrosis; most essayists agree that such a procedure not infrequently results in postoperative ureteral fistula.

The immediate pathologic changes are fistula, extravasation of urine with accompanying cellulitis, or peritonitis. In the case of gynecologic surgery, the urine usually infiltrates the pelvic tissues and is eventually discharged through the abdominal wound, cervical stump, or vaginal cuff. Obviously when urine is excreted into the abdominal cavity a chemical peritonitis of some degree occurs. The magnitude of the reaction is rather dependent upon the degree of infection present, for the peritoneum is exceptionally tolerant of sterile urine. The time elapsing between the injury and fistula formation depends upon the nature of the injury, as will be subsequently discussed.

The contused or ligated ureter does not necessarily result in fistula or permanent renal damage. Spontaneous recovery occasionally occurs if the blood supply is adequate and, in the case of ligation, if the suture is absorbed and the ureteral lumen is re-established. In either case strictures are prone to develop and ultimate renal destruction results if they are not dilated. It is generally believed that when the ureter is completely occluded, immediate hydronephrosis and subsequent renal atrophy develop, frequently without symptoms. In the case of ureteral fistula formation there is usually incomplete drainage, but renal excretion continues, resulting in gradual ureterectasis and progressive, frequently symptomatic hydronephrosis. Renal destruction in such instances is greatly hastened when the hydronephrosis is complicated by infection.

Prophylaxis

The best prophylaxis is to bear in mind the possibility of injuring the ureters whenever they lie near the field of operation. Also, most authorities suggest that following an extensive operation involving the true pelvis the ureters should be identified if possible prior to wound closure.

Sampson,¹² in 1902, was the first gynecologist to recommend preoperative catheterization of both ureters to prevent injury during hysterectomy. Since then the controversy regarding the propriety of such a prophylactic measure has continued unabated and today receives its main support from the urologist. However, even in the urologic ranks there are a few dissenters such as Riches,¹³ who states: "The prophylactic introduction of ureteral catheters is a sad reflection on an operator's self confidence and betokens an inadequate knowledge of the anatomy of the pelvis and its pathological anatomy."

Faulk and Bunkin¹⁰ cite certain objections to the preoperative insertion of ureteral catheters: (1) inability to palpate them; (2) impartation of a false sense of security; (3) alteration of normal ureteral position, thus making it more liable to injury; (4) possibility of initiating urinary tract infection leading to oliguria or reflex anuria. Leventhal,⁹ and Wharton¹⁴ are of the opinion that the use of ureteral catheters is obsolete.

However, with all due respect for the objections cited, there is an abundance of accumulated evidence presented by such authorities as Sisk,¹⁵ Whitlock,¹⁶ Landsteiner,¹⁷ and Moore⁸ indicating that the preliminary insertion of ureteral catheters is a wise precaution, not only in radical gynecologic surgery but also prior to such operations as extensive retroperitoneal node dissections and abdomino-perineal resections.

In a recent five-year period during which 3,414 major gynecologic procedures were performed at the Medical College of Virginia, no injuries occurred in patients with indwelling ureteral catheters. Thus while few will agree with Aschner that ureteral catheters should be passed in every case before pelvic surgery, the consensus is in favor of pre-operative ureteral catheterization in pelvic operations of anticipated difficulty.

It is surprising how few authors recommend pre-operative intravenous urography, which in our opinion is particularly desirable if catheters are not introduced. Landsteiner¹⁷ has listed the benefits of such a study: (1) affords an estimate of renal function and bilateral anatomy; (2) provides a warning of any involvement of the ureters in the pelvic disease; (3) provides means for discovering pre-existing renal and ureteral abnormalities, and, in the event of postoperative urinary complications, prevents such abnormalities from being attributed to the operating surgeon. To these benefits we would add that information imparted by this or some other type of preoperative differential renal function test is imperative before consideration can be given to the feasibility of ligating an injured ureter, even under the most urgent circumstances.

Symptoms and Diagnosis

Most authors emphasize that ureteral injury, unfortunately, is usually unrecognized at the time of the original operation. Postoperative urinary extravasation even into the peritoneal cavity may not be recognized because of the general discomfort and abdominal distention incident to an extensive procedure. However, when pain, distention, toxic symptoms, hematuria, anuria or oliguria, unusual fever, or costovertebral tenderness develop in the immediate postoperative period, ureteral injury must be

considered. Pain and tenderness in the kidney area in such cases are rarely severe and often unnoted, as exemplified in the following case report of L. J.

Renal symptoms are more apt to occur when the ureter has been ligated in the presence of infected urine. Urinary drainage from the abdominal wound or vagina occurs in approximately 50 per cent of reported injuries and is highly indicative of ureteral fistula. It is noteworthy that Adams,¹⁸ in his series of 26 injury cases, established that the majority developed fistula formation from the second to fourth and 12th to 14th postoperative days, but that some fistulae did not develop until the third or fourth week. It would seem logical to assume that the appearance of a fistula within a few hours following surgery is due to incision or division of the ureter. Conversely fistula formation resulting from crushing, ligation, or stripping the ureter is most often delayed days or weeks.

While cystoscopy is the most important diagnostic procedure and should be performed immediately in every suspected case of injury, the additional procedures employed depend primarily on the type of injury suspected. For example, to distinguish a ureterovaginal from a vesicovaginal fistula, cystoscopy may be employed or the bladder filled with methylene blue and note taken concerning whether clear urine continues to leak from the vagina. In other instances excretory or retrograde pyelography may be necessary to identify the exact locus of injury, status of renal function, and extent of hydronephrosis. While these clinical aids usually suffice for a diagnosis, there are a certain number of cases of complex involvement in which it is impossible to make a preoperative diagnosis.

Management

Quite obviously the primary aim of ureteral injury treatment is twofold: (1) renal preservation and (2) ultimate restoration of urinary tract continuity to as near a normal state as possible. That neither of these goals is achieved in all cases reflects the fact we must continue to enhance our knowledge of ureteral pathologic physiology and surgical acumen if we hope to improve our operative statistics.

There appears to be universal agreement concerning certain fundamental principles of treatment of such injuries, namely: (1) adequate extra-peritoneal drainage in the prevention of extravasation; (2) early recognition and repair of injury; (3) avoidance of deliberate ureteral ligation for the purpose of producing hydronephrotic atrophy; (4) diversion of the urinary stream above the point of injury to protect the kidney and prevent extravasation at the injury site; and (5) employment of polyethylene or plastic tubing for splinting purposes since they are

considered superior to all other materials. However, D. M. Davis²⁵ has recently reported two serious antigenic reactions from such synthetic splints, resulting in ureteral granulomas. While we have not encountered such complications, the warning cannot be ignored.

Because the circumstances of the injury and the causative agent will vary, the management of each case presents an individual problem. Thus, only the highlights of treatment under certain standardized situations can be touched upon.

Injuries recognized *during* the operation can be discussed under two general headings: (1) ureteral ligation or crushing and (2) partial or complete ureteral division. There appears to be no controversy about the first type of injury because removal of the ligature from about the ureter is usually sufficient, although occasionally fistula results when the ligature has remained only a short time. Therefore, it is recommended that a ureteral splinting catheter of adequate calibre be introduced postoperatively and allowed to remain two to three weeks, as in the case of crushing injuries of short duration.

When the ureter has been severely traumatized with prolonged clamping, it is safer to resect the devitalized area and anastomose the ureter or implant the proximal end into the bladder. When the ureter is only partially severed, it should be immediately repaired with interrupted fine chromic suture material, care being taken not to penetrate the mucosa. Riches and Dodson¹⁹ recommend in cases of end to end anastomosis that a small opening in the ureter above the anastomosis be made through which a catheter is passed into the renal pelvis, thus completely diverting the urinary stream.

The procedure of choice when the ureter is severed below the pelvic brim and not more than 5 cm. from the bladder is ureteroneocystostomy with placement of the ureteral orifice as near the trigone as possible. When transection occurs too high for re-implantation, end to end uretero-ureteral anastomosis is indicated. There is no unanimity concerning the best treatment for cases where a segment of the ureter has been excised. Some recommend cutaneous ureterostomy, others ureterosigmoid anastomosis, each having well appreciated disadvantages which, in our opinion, make the methods undesirable. Trans-uretero-ureteral anastomosis is technically a difficult procedure and, in spite of Moore's success, always carries the risk of failure with irreversible damage to the originally uninvolved ureter.

In the last two years considerable attention has been focused on ureteroileocystoplasty in cases of permanently damaged ureters; such a procedure is mechanically and technically feasible.²⁶ Ureteral ligation has generally been condemned; however, such

a temporary procedure might well be indicated in a poor risk patient where the urine is known to be sterile and function of the opposite kidney known to be adequate. This statement is made in view of Moore's report of a case in which the ureter was occluded for three months. After corrective surgery the kidney resumed its normal function. Regardless of the type of treatment employed, it is paramount that extraperitoneal drainage be established to the injury site.

Injuries recognized *after completion* of the operative procedure constitute the greatest number with which we have to contend. It is also a group concerning which there is considerable variation of opinion. While many modern authors (Whitlock, Patton, Aschner, Moore, and Feiner²⁰) consider immediate bilateral deligation a hazardous and difficult procedure, Conger, Rolnick,²¹ Herman,²² and a few others recommend that the abdominal incision be reopened within 24 to 48 hours, providing the patient's condition permits and it is impossible to pass a catheter beyond the obstructions. The majority of urologists would favor temporary nephrostomy as being the safer procedure.

When only one ureter is occluded, if the opposite kidney is functioning normally and there is no evidence of renal infection, a conservative nonoperative course is advised by a few; most, however, recom-

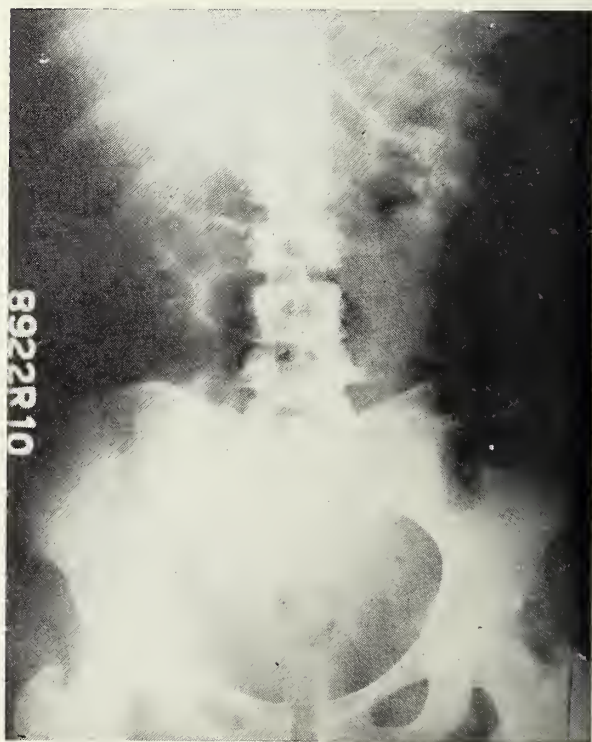


Figure 1. Left hydronephrosis with calyectasis and non-functioning right kidney.

mend neocystostomy as soon as the patient's condition permits and before dense adhesions have had time to form.

When unilateral uretero-cutaneous or ureterovaginal fistula occurs, operation may be deferred until the patient has recovered from the primary operative procedure—provided there is adequate uretero-fistula drainage, or nephrostomy or ureteros-tomy has been performed as a preliminary step. If the involved side has good function, etc., the drainage channel should ultimately be re-established either by end to end anastomosis or ureterovesical implantation, the latter being preferable if the proximal ureteral segment will reach directly or with the aid of a bladder flap as described by Ockerblad.^{23, 24} If there is evidence of renal damage or infection on the involved side, nephrectomy will give the best results unless the opposite kidney is also deficient.

Case Reports

Two typical case histories will be presented to illustrate certain of the problems encountered in the diagnosis and care of patients with ureteral injuries. The first case report is illustrative of a postpartum hysterectomy complication; the second depicts the potential hazard of routine hysterectomy and demonstrates the value of perseverance in caring for such injuries.



Figure 2. Acorn-tip catheter injection demonstrating kinking and stenosis of the distal left ureter.



Figure 3. Acorn-tip catheter injection of right ureter indicating complete obstruction. Left hydronephrosis is demonstrated.

L. J., a 29-year-old Gravida VII, Para VI Negro female, was admitted to the Obstetrical Division, Medical College of Virginia, in April, 1955, because of premature rupture of membranes. Following delivery uterine hemorrhage occurred and was uncontrolled by intra-uterine packing or curettment, necessitating an easily performed total abdominal hysterectomy 10 hours postpartum.

Gross painless hematuria developed immediately after surgery and was attributed to bladder trauma incident to the surgery. A decreased urinary output was believed to be secondary to impaired renal blood flow occurring prior to and again during surgery as a result of excessive blood loss. Thirty-six hours after surgery the gross hematuria cleared, and the patient's urinary output improved as she became afebrile.

Because of persistent microscopic hematuria, an intravenous pyelogram was performed six days following hysterectomy (Figure 1), revealing left hydronephrosis and a non-functioning right kidney. The patient continued to demonstrate no localizing symptoms. Retrograde pyelography was immediately performed, demonstrating kinking and marked stenosis of the distal four centimeters of the left ureter (Figure 2). At this time a small calibre catheter was fortuitously inserted past the obstruction and

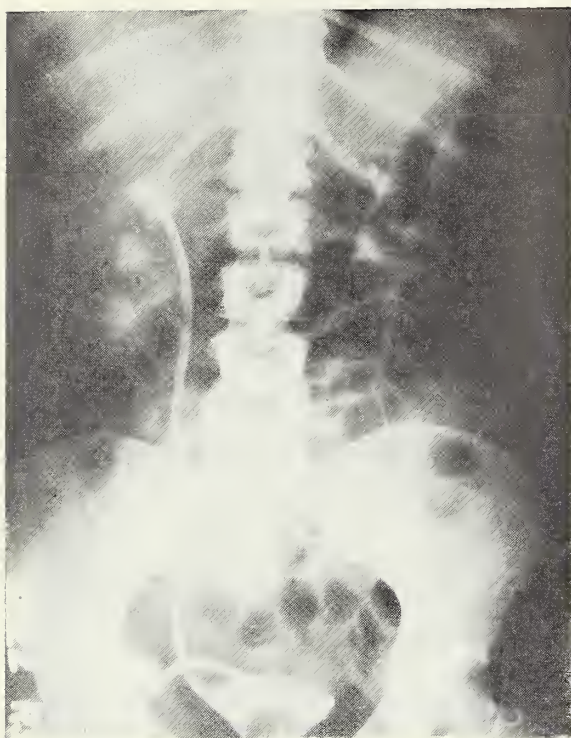


Figure 4. Intravenous pyelogram ten days postoperatively demonstrating return of right renal function. Note normal configuration of left renal pelvis.

into the left renal pelvis. Numerous attempts to insert various types of catheters beyond a point 3 cm. proximal to the right ureteral meatus were unsuccessful. Foley cone tip catheter injection of the right ureter indicated a complete obstruction involving the terminal portion of the ureter (Figure 3).

During the ensuing four days it was possible to replace the No. 4 French left ureteral catheter with a No. 6. Thus adequate drainage was assured for the left kidney. The patient remained afebrile and without right renal symptoms.

Eleven days postoperatively an extra peritoneal right ureteroneocystostomy was performed with moderate difficulty due to retroperitoneal edema in the region of the bladder and at the level of the broad ligament. It was found that the ureter had been included in a transfixing ligature also placed about the right uterine artery. Because of the marked hydro-ureter formation proximal to the point of ligation, a No. 12 French Levine tube was employed as a splint for the re-implanted ureter previously severed at the proximal point of obstruction some 3 cm. above the bladder (Figure 4).

The right ureteral splint tube was left in place 16 days; the left ureteral catheter remained in place for 10 days. Following their removal the patient

continued to make an uneventful recovery and was dismissed from the hospital 20 days after the urologic surgery.

An intravenous pyelogram six weeks later (Figure 5) indicated satisfactory bilateral function with evidence of residual right pyelonephritis and an essentially normal-appearing left kidney. Left ureteral calibration and dilatation were subsequently performed every six weeks for the following six months.

C. S., a 41-year-old Negro, was admitted to the Surgical Service, Medical College of Virginia, in January, 1955, with a diagnosis of large uterine leiomyomata, chronic cervicitis and salpingitis, and a left ovarian cyst.

Three days later a total abdominal hysterectomy and left salpingo-oophorectomy were performed. During the operation in an effort to control vigorous bleeding from the left uterine artery, the adjacent ureter was clamped and severed. A primary end to end uretero-ureteral anastomosis was performed employing a number 7 ureteral catheter as a splint (Figure 6). Extra peritoneal drainage was established by placing a Penrose drain in the immediate area of the repair and allowing it to emerge through the vaginal cuff. The distal end of the splint tube was subsequently removed from the bladder by cystos-

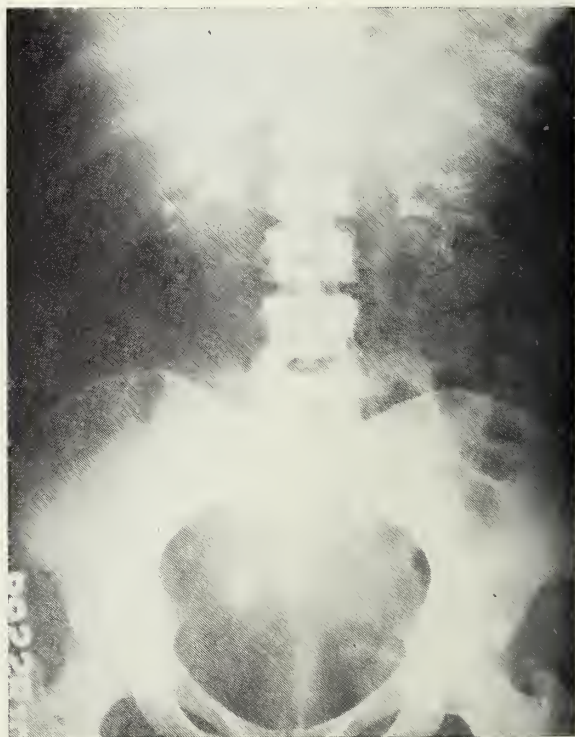


Figure 5. Intravenous pyelogram six weeks postoperatively demonstrating minimal calyceal distortion.

copy, and it was secured to a Foley catheter placed in the bladder.

On the fifth postoperative day the patient developed acute bronchial asthma and signs and symptoms of intestinal obstruction. In the performance of x-ray studies to establish the diagnosis, the Foley catheter became deflated and was ultimately removed with the attached ureteral splinting catheter. Immediate cystoscopic efforts to catheterize the left ureter were unsuccessful. Because of the patient's precarious condition, no further operative procedures were attempted until the asthmatic crisis was controlled by corticotrophic hormones and the severe ileus by gastric suction.

The patient immediately developed a uretero-vaginal fistula following removal of the splinting catheter, associated with hydronephrosis, chills, and fever. By the seventh postoperative day her general condition was sufficiently improved to permit a left nephrostomy and successful antegrade ureteral intubation with the distal tip of the catheter placed within the bladder. The splinting catheter was removed through the nephrostomy wound in 12 days. Immediately the patient had chills and fever for six days, presumably due to a proteus vulgaris left pyelonephritis which was ultimately controlled by

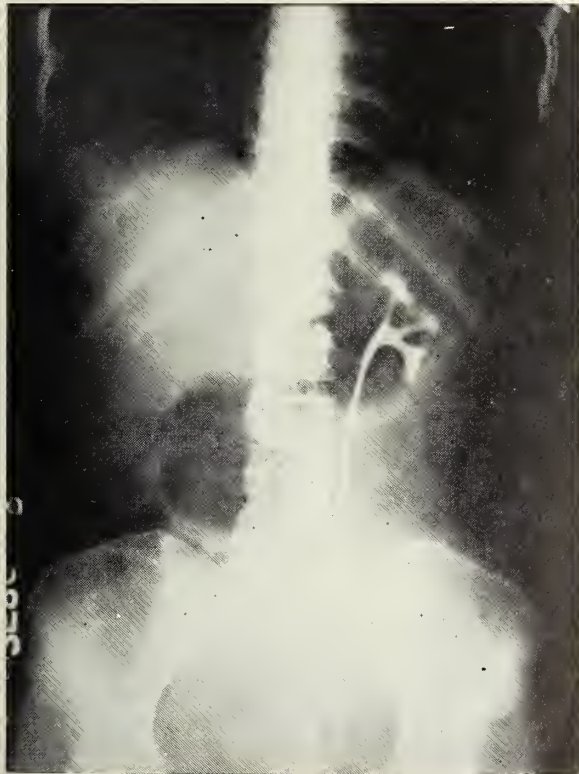


Figure 6. Postoperative film demonstrating excellent positioning of left ureteral splinting catheter.

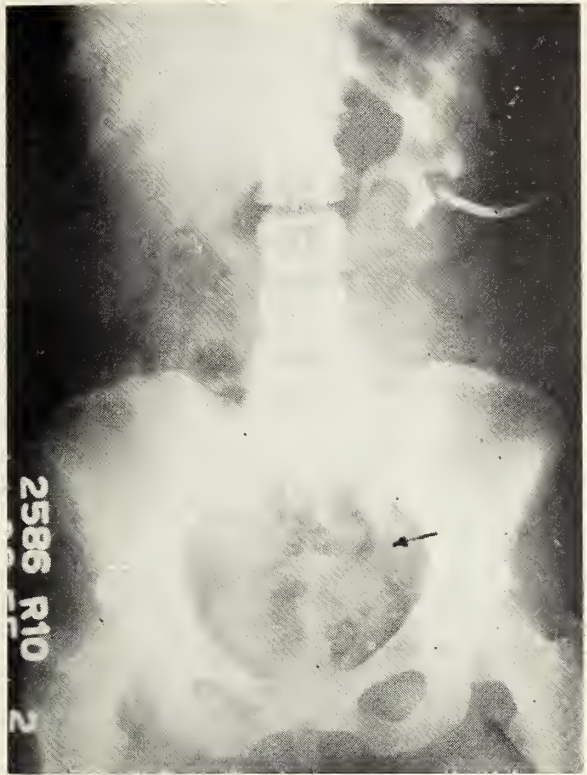


Figure 7. Nephrostomy tube antegrade left pyelogram demonstrating ureteral dilatation proximal to the anastomosis.

Chloromycetin combined with Gantrisin. There was no evidence of fistulous drainage at this time; however, the ureter was not visualized in its distal one-third and appeared dilated proximal to the anastomotic site (Figure 7).

Following the performance of an antegrade pyelogram on the patient's 22nd postoperative day, she was dismissed afebrile, ambulatory, with instructions to maintain the nephrostomy drainage because of extravasation at the anastomotic site and recurrence of the vaginal urinary fistula upon clamping of the nephrostomy tube (Figure 8).

The patient was carefully followed as an outpatient in the Urology Clinic, and 14 days following dismissal the fistulous drainage spontaneously ceased. Twenty days later an antegrade pyelogram revealed satisfactory renal drainage and no extravasation; thus the nephrostomy tube was removed.

The patient remained asymptomatic; however, in April, 1955, left ureteral dilatation was performed with ease and no stricture was encountered. Two weeks later an intravenous pyelogram revealed satisfactory renal function but left calyceal distortion and evidence of left renal damage which accounted

for her pyuria of 3 to 5 white blood count per high power field (Figure 9).

As in the first case, ureteral calibration was carried out at six-week intervals for the ensuing six months, and the patient remained symptom-free.

Summary and Conclusions

1. In a five-year study of 3,414 major gynecologic surgical procedures at the Hospital Division of the Medical College of Virginia, there were 24 ureteral injuries giving an incidence of 0.70 per cent.

2. An attempt has been made to review the pathogenesis, pathology, diagnosis, and general management of the surgically injured ureter.

3. We believe it highly advisable for all gynecologic or general surgical patients upon whom extensive operative procedures are contemplated to have the benefit of a urologic survey prior to surgery.

4. The introduction of inlying ureteral catheters immediately before extensive surgical procedures will, in our opinion, safeguard the patient; it should also enhance the operator's medico-legal position in the event that ureteral injury occurs, a situation unlikely to arise if this precaution is taken.



Figure 8. Antegrade pyelogram performed on 22nd postoperative day. Note extravasation of contrast media at site of anastomosis. Ureteral dilatation is less than in Figure 7.

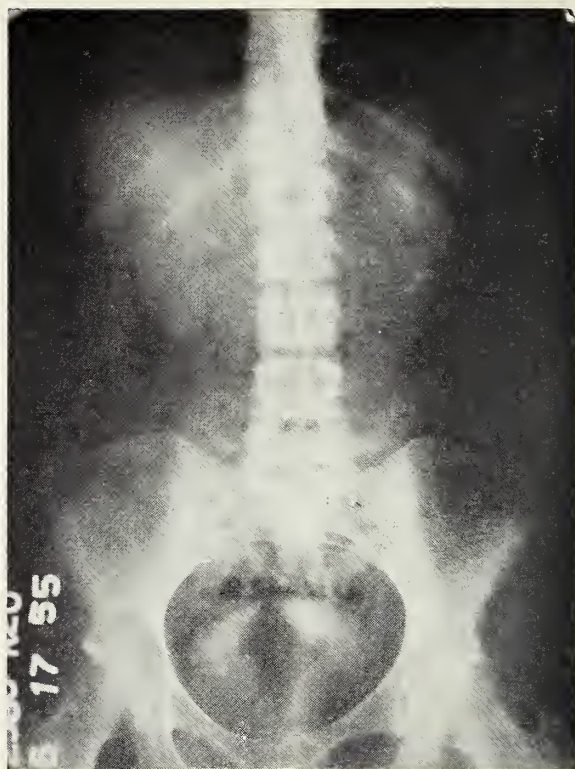


Figure 9. Intravenous pyelogram six months postoperatively revealing satisfactory left renal function.

5. Further experimental studies are indicated to ascertain how long the kidney can be completely obstructed and still be expected to recover with reestablishment of the ureteral channel. It is conceivable that the deliberate temporary ligation of the proximal end of a sectioned ureter under certain circumstances would be practical and safe.

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Serum Transaminase

Clinical Experience with 211 Patients

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The determination of serum transaminase values is proving to be a valuable adjunct in the diagnosis of certain diseases, especially of the heart and liver. That serum glutamic oxalacetic transaminase (SGO-T) is elevated following acute myocardial infarction is well established. This enzyme is also increased in hepatic necrosis. Serum glutamic pyruvic transaminase (SGP-T) is not appreciably elevated following acute cardiac necrosis but is more sensitive than SGO-T in diagnosing acute hepatocellular damage. In this paper we are reporting some results of transaminase studies in patients in whom the test was of definite value in the diagnosis and management of the diseased state.

Methods and Individuals Studied

SGO-T was measured by a modification of the spectrophotometric method of Karman, Wroblewski, and LaDue.⁹ The modifications were essentially those of Steinberg and Ostrow³ and Steinberg, Baldwin, and Ostrow.¹⁰ The SGP-T method used was basically that of Wroblewski and LaDue⁷ with the same modifications as used in SGO-T measurements. The SGO-T activity of a given serum was found to be stable, especially if the serum was kept frozen. Even at room temperature, the activity does not change appreciably for several days.

SGP-T activity is not so stable as SGO-T. The loss of activity is erratic from sample to sample, even in those samples kept frozen. To get reliable SGP-T values, we have found it advisable to analyze the serum within a few hours after the blood is drawn. If serum stands on the clot for more than a few hours, it acquires the tendency of almost instantaneously oxidizing diphosphopyridine nucleotide (DPNH). To check uniformity in reactions, we have run a "known" serum sample with each battery of un-

knowns, preferably using a sample with activity at the upper limit of normal. The units used in this paper are those of Karmen et al.⁹

In the past nine months, 386 SGO-T and 215 SGP-T determinations have been made on 211 patients in our laboratory. The individuals were private patients of the Snyder Clinic, Winfield, or patients at the Winfield State Training School, an institution for the mentally retarded. To establish normal values, 104 SGO-T and 47 SGP-T determinations were done on 77 healthy controls. We were measuring SGO-T activity several months before we were meas-

Determination of SGO-T and SGP-T values is of help in both diagnosis and therapy of patients with acute myocardial infarctions and diseases of the hepatobiliary system. Preliminary results indicate that more data will assist in differentiating between hepatocellular and obstructive jaundice.

uring SGP-T activity. To allow fuller use of the material presented here, parallel data on the two enzymes would have been ideal.

To establish diagnosis in each case, the usual diagnostic techniques, including electrocardiogram and x-ray studies as needed, were carried out. In patients with suspected liver disease, other biochemical tests done were serum cholinesterase (ChE), cephalin flocculation, thymol turbidity, alkaline phosphatase, and total and esterified cholesterol. Normal values for these characteristics had previously been established in our laboratory. Blood samples were drawn from patients in the fasting state in those in whom we were following the battery of liver function tests. In initial samples drawn from patients with suspected myocardial infarction, blood was drawn without regard for meals. In determining normal transaminase activities, serum samples were not necessarily from individuals in the basal state.

Results

In Table 1 are shown some results on patients with

From The H. L. Snyder Memorial Research Foundation, Winfield. The authors wish to thank the staffs of the Snyder Clinic and the Winfield State Training School Hospital for the use of their clinical material. Especially appreciated is the cooperation of Bryce Hinkson, M.D., resident in internal medicine, Winfield State Training School.

Reagents for SGO-T and SGP-T determinations were obtained from the California Foundation for Biochemical Research, Los Angeles, except lactic dehydrogenase. That was obtained from Delta Chemical Works, New York, or Sigma Chemical Company, St. Louis.

TABLE 1
ACUTE MYOCARDIAL INFARCTIONS

| <i>Patient</i> | <i>Remarks</i> | <i>Date</i> | <i>SGO-T</i> | <i>SGP-T</i> |
|------------------|--|-------------|--------------|--------------|
| WP | Acute myocardial infarction—blood drawn 2 hrs. after onset of pain 19 hrs. after onset of pain | 5-14-56 | 19.0 | |
| | | 5-15-56 | 108.0 | |
| | | 5-16-56 | 75.0 | |
| | | 5-18-56 | 25.0 | |
| | | 5-24-56 | 15.0 | |
| | | 12-11-56 | 15.0 | |
| CC | Hospital admission Acute myocardial infarction 8-1-56 | 7-28-56 | 10.0 | 7.0 |
| | | 8-1-56 | 482.0 | 70.0 |
| | | 8-2-56 | 182.0 | 55.0 |
| | | 8-7-56 | 20.0 | 72.0 |
| | | 8-15-56 | 76.0 | 164.0 |
| | Deceased 8-16-56. Severe chronic passive congestion of liver, gastric hemorrhage found at autopsy. | | | |
| AS | Acute myocardial infarction 1-23-57 Improving clinically | 1-24-57 | 225.0 | 30.0 |
| | | 1-25-57 | 140.0 | 34.0 |
| | | 1-26-57 | 89.0 | 49.0 |
| FA | Acute myocardial infarction 12-3-56 | 12-3-56 | 52.0 | 14.0 |
| | | 12-4-56 | 38.5 | 13.0 |
| | Pulmonary emboli with infarctions 12-17-56 | 12-17-56 | 30.0 | 27.5 |
| | | 12-29-56 | 24.5 | 39.5 |
| CG | Acute myocardial infarction 4-18-56 On chlorpromazine from 4-19-56 through 5-9-56 | 4-19-56 | 60.0 | |
| | | 4-20-56 | 42.0 | |
| | | 4-21-56 | 38.0 | |
| | | 4-24-56 | 40.0 | |
| | | 5-1-56 | 35.0 | |
| | | 5-8-56 | 77.0 | |
| | | 5-9-56 | 89.0 | |
| SJ | Hospital admission Arteriosclerosis with anginal syndrome Acute anterior myocardial infarction | 11-19-56 | 20.0 | 15.0 |
| | | 11-21-56 | 11.0 | 12.0 |
| | | 12-1-56 | 77.0 | 14.0 |
| VM | Acute myocardial infarction 9-10-56 Deceased later this date | | | |
| | | 9-11-56 | 74.0 | 19.0 |
| BM | Acute posterior myocardial infarction, 7-11-56, 2:30 PM 17 hrs. after onset of pain | | | |
| | | 7-12-56 | 94.0 | 20.0 |
| | | 7-17-56 | 10.0 | 14.0 |
| HM | Uremia, salt losing nephritis Acute myocardial infarction 6-3-56 Deceased 6-5-56 | 5-22-56 | 10.9 | |
| | | 6-4-56 | 460.0 | |
| | | | | |
| DL | Acute myocardial infarction 3-2-56 Deceased 3-15-56 | | | |
| | | 3-7-56 | 50.8 | |
| | | 3-14-56 | 31.3 | |
| Healthy Controls | No. | | 77 | 37 |
| | Range | | 8.5-29.2 | 5.5-22.5 |
| | Mean | | 14.6 | 12.1 |

acute myocardial infarctions, along with mean normal values for SGO-T and SGP-T. The time of drawing blood for transaminase assay, in relation to time of attack, is important. In patient W.P., the first blood sample was drawn within a few hours after the suspected infarction. The transaminase value was normal, but in a sample drawn 19 hours after the onset of pain it was elevated to 108 SGO-T units. The value had returned to normal in four days.

The highest SGO-T observed in our series was 482 units in patient C.C. In the same serum sample, SGP-T activity was elevated to 70 units. The SGO-T fell rapidly to a value of 20 units six days after the infarction, but the SGP-T value was increased over the preceding value. The sample drawn the day before death showed SGP-T value of 164 units and SGO-T of 76 units. This elevation of SGP-T in excess to SGO-T was suggestive of liver disease. At autopsy it was found that there was severe chronic passive congestion of the liver and gastric hemorrhage.

In patient A.S., the first SGO-T determination (225 units) was helpful in establishing the diagnosis since the electrocardiogram showed complete A.V. block with idioventricular rhythm. Three days after the attack the SGO-T value had dropped to 89 units. The patient was improving clinically, with no complications. The upward trend of SGP-T cannot be explained, nor can the outcome of the illness be given since it is only four days since the infarction.

In patient F.A., the course of recovery from the myocardial infarction was complicated by pulmonary emboli with infarctions two weeks after the heart attack. The slight elevation of SGP-T found in the last sample reported here is probably a reflection of the liver damage resulting from the circumstances of the illness.

The pattern of SGO-T is different in patient C.G. than in any other patient shown in Table 1. The value fell rather slowly from 60 units on the day after the infarction to 35 units in 12 days, and it rose to 89 units in the next eight days. Repeated electrocardiograms and other diagnostic procedures did not show any evidence of a second infarction. The patient had been given chlorpromazine on admission to the hospital and was continued on this medication throughout the period of our observations. It is probable that this secondary rise in SGO-T was due to early drug toxicity, but we cannot be certain since studies could not be made after the drug was discontinued. It is unfortunate that SGP-T determinations were not done on this patient for they should have helped identify the source of the increased SGO-T.

Laboratory data from other patients shown in Table 1 are meager, but sufficient notes and dates are included to make the results self-explanatory.

In spite of the fact that SGP-T data was not taken on many samples, it is apparent in Table 1 that SGO-T is more sensitive to myocardial damage than SGP-T. After a rise in SGO-T activity following a heart attack, the enzyme level rapidly falls and reaches normal in two to seven days. The finding of normal SGO-T values in some patients has been helpful in ruling out acute myocardial infarctions. The time at which the blood sample is drawn, in relation to the infarction, is important. The abnormal level of SGO-T is not reached until about six hours after the attack and may not persist more than 24 to 72 hours after the infarction.

In Table 2 are shown the results of SGO-T and SGP-T from 10 patients with infectious hepatitis, along with results of other liver function tests. Normal values for all characteristics are shown. Of the 10, six were residents of the Winfield State Training School and three were employees of the same institution.

Both SGO-T and SGP-T values are many times greater than normal at the height of the illness. In all patients in whom both SGO-T and SGP-T studies were made, SGP-T is the higher of the two, although they rise and fall together. SGO-T values reach much higher levels in hepatitis than in myocardial infarctions, as can be seen by comparing data in Table 1 and Table 2. There is no consistent relationship between the transaminase values and any other liver function test. The magnitude of change in SGP-T values is much greater than in any of the more common tests. It is especially helpful to have a more sensitive test for such patients as C.B., who at no time had a serum bilirubin above normal. It is noteworthy that her highest bilirubin, 0.8 mg/100 ml., was found in the serum with the highest SGP-T value, 515 units. On admission to the hospital, this patient had anemia (Hb 7.3 gm/100 ml.), which responded promptly to iron therapy. Within any one case there is a reciprocal relationship between serum cholinesterase and SGO-T or SGP-T until the patient approaches recovery.

In Table 3 are given some results of serum transaminase and other liver function tests from a group of patients with diseases of the hepatobiliary system other than infectious hepatitis.

Patient S.C. had infectious mononucleosis with liver involvement. At the time he came under observation SGO-T activity was 173 units. Serum bilirubin, alkaline phosphatase, and thymol turbidity were each elevated and cephalin flocculation was 4 plus. With treatment, the clinical improvement of the patient was as rapid as the fall in SGO-T would indicate.

There are three patients in the group with chlorpromazine jaundice. Blood samples were drawn soon

TABLE 2
INFECTIOUS HEPATITIS

| Patient | Date | SGP-T | SGO-T | Serum Cbe | Bilirubin | Ceph. Flocc. | Tbymol Turb. | Alk. Phos- phatase | % Chol. esters |
|---------|----------|-------|-------|--------------|-----------|-----------------|-----------------|-----------------------|-------------------|
| | | UNITS | UNITS | UNITS | MG/100 ML | | UNITS | UNITS | |
| LJ | 7-6-56 | 1080 | 935 | 1.49 | 7.4 | 4+ | 2.7 | 10.6 | 51 |
| | 7-11-56 | 633 | 691 | 1.52 | 4.0 | 3+ | 2.4 | 10.6 | 61 |
| | 7-17-56 | 454 | 111 | 1.62 | 2.5 | 3+ | 2.2 | 6.7 | 73 |
| | 7-20-56 | 367 | 122 | 2.06 | 2.9 | 2+ | 2.4 | 6.7 | 65 |
| | 7-25-56 | 171 | 103 | 1.62 | 0.7 | 4+ | 1.7 | 5.7 | 55 |
| | 8-1-56 | 147 | 191 | 1.89 | 0.4 | 4+ | 0.8 | 6.0 | — |
| | 8-3-56 | 95 | 72 | — | — | — | — | — | — |
| | 8-15-56 | 47 | 25 | 2.05 | 0.1 | 3+ | 1.0 | 5.3 | — |
| | 8-22-56 | 29 | 38 | 1.98 | 0.1 | 2+ | 0.8 | 4.3 | — |
| | 8-29-56 | 18 | 24 | 2.15 | 0.2 | 0 | 0.6 | 4.0 | — |
| | 9-12-56 | 12 | 24 | 1.82 | 0.1 | 3+ | 0.5 | 3.7 | — |
| | 11-27-56 | 10 | — | 1.96 | 0.2 | 0 | 0.4 | 4.0 | 83 |
| LR | 8-17-56 | 1350 | 296 | 1.16 | 3.8 | 4+ | 1.3 | 21.4 | 48 |
| | 8-29-56 | 590 | 176 | 1.50 | 0.9 | 4+ | 0.8 | 13.2 | — |
| | 9-5-56 | 195 | 79 | 1.74 | 1.2 | 3+ | 0.6 | — | — |
| | 9-10-56 | 99 | 50 | 1.81 | 0.8 | 2+ | 0.4 | 13.8 | — |
| | 9-19-56 | 36 | 23 | 1.48 | 0.7 | 2+ | 0.7 | 12.2 | — |
| | 10-9-56 | 19 | 18 | 1.66 | 0.6 | 2+ | 0.3 | 7.4 | — |
| | 10-22-56 | 15 | 19 | 1.59 | 0.3 | 2+ | 0.3 | 6.9 | 72 |
| SB | 9-11-56 | 358 | 253 | 2.42 | 9.6 | 4+ | 2.7 | 20.1 | 56 |
| | 9-19-56 | 272 | 118 | 2.27 | 2.7 | 4+ | 3.2 | 14.2 | 73 |
| | 10-18-56 | 34 | 35 | 2.62 | 1.0 | 3+ | 1.0 | 6.4 | — |
| | 10-31-56 | 20 | 24 | 3.00 | 0.4 | 0 | 0.6 | 7.0 | — |
| | 1-9-57 | 7 | 14 | 3.19 | 0.4 | 1+ | 0.3 | 5.3 | 80 |
| MH | 8-4-56 | 303 | 102 | — | 17.4 | — | — | — | — |
| | 8-8-56 | 563 | 200 | 1.16 | 16.6 | 4+ | 1.6 | 16.3 | 14 |
| | 8-15-56 | 290 | 137 | 1.13 | 7.6 | 4+ | 1.6 | 17.1 | — |
| | 8-20-56 | 503 | 80 | 1.00 | 6.5 | 4+ | 1.7 | 19.1 | 21 |
| | 8-29-56 | 138 | 110 | 0.76 | 3.8 | 4+ | 1.8 | 18.6 | 68 |
| | 9-5-56 | 76 | 99 | 0.66 | 4.5 | 4+ | 1.6 | — | — |
| | 9-10-56 | 67 | 72 | 0.94 | 3.5 | 4+ | 1.3 | 14.7 | — |

TABLE 2 (Cont.)
INFECTIOUS HEPATITIS

| Patient | Date | SGP-T | SGO-T | Serum ChE | Bilirubin MG/100 ML | Cepb. Flocc. | Thymol Turb. | Alk. Phos- phatase | % Chol. esters |
|------------------|---|----------|----------|--------------|------------------------|-----------------|-----------------|-----------------------|-------------------|
| | | UNITS | UNITS | UNITS | | | | UNITS | |
| SBU | 12-26-56 | 846 | 102 | 1.36 | 5.3 | 4+ | 0.4 | 15.3 | 62 |
| | 1-16-57 | 22 | 27 | 1.67 | 1.8 | 1+ | 0 | 7.2 | 71 |
| NB | 1-14-57 | 1163 | 1196 | — | 7.3 | 4+ | 1.9 | 14.2 | — |
| | 1-17-57 | 1093 | 553 | 1.64 | 11.1 | 4+ | 1.4 | 14.4 | 26 |
| | 1-22-57 | 1325 | 1258 | 1.23 | 19.4 | 4+ | 2.5 | 11.9 | 26 |
| | 1-29-57 | 1917 | 1592 | 1.27 | 28.8 | 4+ | 2.8 | 12.8 | 43 |
| WS | 9-27-56 | 1125 | 365 | 1.64 | 8.2 | 3+ | 0.2 | 32.6* | 43 |
| | 10-1-56 | 1075 | 257 | 1.67 | 4.8 | 3+ | 0.2 | 27.9 | 66 |
| | 10-5-56 | 739 | 216 | 1.66 | 3.0 | 1+ | 0.2 | 24.9 | 62 |
| | 10-15-56 | 705 | 172 | 1.90 | 2.4 | 3+ | 0.6 | 23.2 | 83 |
| | 10-22-56 | 508 | 165 | 1.81 | 1.4 | 4+ | 0.3 | 21.7 | — |
| | 11-5-56 | 215 | — | 2.22 | 1.0 | 4+ | 0.4 | 25.4 | — |
| | 11-19-56 | 131 | 68 | 2.43 | 0.7 | 4+ | 0.2 | 24.9 | — |
| | 12-3-56 | 81 | 72 | 2.24 | 1.0 | 3+ | 0.3 | 28.8 | 61 |
| | 12-28-56 | 59 | 50 | 2.01 | 0.7 | 0 | 0 | 27.4 | 57 |
| | * Male, age 14 (Normal range of alkaline phosphatase in children, 10-20 units). | | | | | | | | |
| | | | | | | | | | |
| Healthy Controls | No. | 37 | 77 | 125 | 126 | 100 | 108 | 78 | 84 |
| | Range | 5.5-22.5 | 8.5-29.2 | 1.50-3.00 | 0-1.0 | 0-1+ | 0-1.0 | 2.15-10.4 | 65-80 |
| | Mean | 12.1 | 14.6 | 2.32 | 0.44 | 0 | 0.60 | 5.48 | 75 |

TABLE 3
HEPATOBIILIARY DISEASES OTHER THAN INFECTIOUS HEPATITIS

| Patient | Diagnosis and Remarks | Date | SGP-T | | SGO-T | | Serum C _{BE} | Bilirubin MG/100 ML | Cepb. Floc. | Thymol Turb. | Alk. Phos- phatase UNITS | Total Chol. | | % Chol. esters |
|---------|---|----------|-------|-------|-------|-------|--------------------------|------------------------|----------------|-----------------|--------------------------------|------------------|----|-------------------|
| | | | UNITS | UNITS | UNITS | UNITS | | | | | | MG/100 ML | | |
| SC | Infectious mononucleosis with liver involvement. ACTH given 4-20 through 4-30-56 | 4-19-56 | — | 173 | 2.82 | 1.6 | 4+ | 1.8 | 22.9 | | | | | |
| | | 4-21-56 | — | 67 | 2.60 | 1.4 | 4+ | 3.3 | 23.3 | | | | | |
| | | 4-24-56 | — | 46 | 2.41 | 0.2 | 4+ | 2.9 | 21.8 | | | | | |
| | | 5-1-56 | — | 23 | 2.62 | 0.5 | 3+ | 2.4 | 11.5 | | | | | |
| NJ | Chlorpromazine jaundice, discontinued 11-6-56 | 11-7-56 | 262 | 110 | 1.57 | 3.2 | 0 | 0.3 | 21.6 | | | | | |
| | | 11-12-56 | 193 | 91 | 1.64 | 1.6 | 1+ | 0.3 | 22.9 | | | | | |
| DB | Chlorpromazine jaundice, discontinued 1-10-57 | 1-10-57 | 455 | 340 | 2.10 | 1.2 | 3+ | 0.4 | 19.8 | | | | | |
| | | 1-14-57 | 157 | 57 | 2.07 | 0.2 | 1+ | 0.6 | 34.2 | | | | | |
| NV | Chlorpromazine jaundice, discontinued 9-21-56 | 9-24-56 | 130 | 76 | 2.08 | 1.3 | 1+ | 0.6 | 28.5 | | | | | |
| | | 9-29-56 | 33 | 51 | 2.23 | 0.8 | 0 | 0.6 | 39.0 | | | | | |
| | | 11-12-56 | 10 | — | 2.48 | 0 | 4+ | 0.7 | 9.6 | | | | | |
| | | | | | | | | | | | | | | |
| PB | Malignant hypertension with toxic hepatitis from medication | 6-23-56 | — | 451 | 2.68 | 1.2 | 1+ | 0.2 | 15.4 | | | | | |
| | | 6-28-56 | — | 29 | 2.70 | 0.2 | 0 | 0.6 | 9.8 | | | | | |
| | | 10-24-56 | 138 | 114 | 2.62 | 0.2 | 1+ | 0.3 | 12.2 | | | | | |
| | | 10-26-56 | 76 | 34 | 2.70 | 0.3 | 2+ | 0.4 | 9.0 | | | | | |
| | | 11-5-56 | 16 | — | 3.36 | 0.6 | 3+ | 0.6 | 10.0 | | | | | |
| | | 11-26-56 | 9 | 8 | 3.26 | 0.2 | 2+ | 0.4 | 7.5 | | | | | |
| | | 1-9-57 | 10 | 14 | 3.38 | 0.2 | 2+ | 0.4 | 7.9 | | | | | |
| MH | Paracentesis 11-2-56. Deceased 11-4-56, amebic abscess of liver found at autopsy. | 10-19-56 | — | — | 0.83 | 0.2 | 1+ | 0.7 | 16.6 | | | 116 | 45 | |
| | | 10-29-56 | 81 | 130 | — | — | — | — | — | | | — | — | |
| | | 11-1-56 | 66 | 83 | 0.48 | 2.6 | 3+ | 0.6 | 27.3 | | | 86 | 31 | |
| | | 11-2-56 | 63 | 83 | 0.54 | 4.1 | 2+ | 0.6 | 25.3 | | | 66 | 23 | |
| CB | Ca of prostate. 100 mg. i.m. testosterone propionate given/day 5-7 to 5-9-56, inclusive. Bilateral orchiectomy 5-11-56. Stilbesterol 5-18-56 to 8-15-56, inclusive. | | | | | | | | | | | Acid phosphatase | | |
| | | | | | | | | | | | | | | 17.0* |
| | | 5-2-56 | — | 42 | 1.61 | — | 0 | 0.1 | 22.9 | | | | | 22.4 |
| | | 5-4-56 | — | 57 | 2.02 | — | 0 | 0.1 | 25.3 | | | | | 13.5 |
| | | 5-7-56 | — | 75 | 1.62 | 0.4 | 0 | 0.1 | 29.2 | | | | | 29.5 |
| | | 5-9-56 | — | 78 | 1.61 | 0.2 | 0 | 0 | 25.6 | | | | | 17.6 |
| | | 5-11-56 | — | 84 | 1.47 | 0.1 | 0 | 0.2 | 24.4 | | | | | 11.3 |
| | | 5-12-56 | — | 97 | 1.42 | 0.2 | 0 | 0.1 | 22.2 | | | | | 6.9 |
| | | 5-14-56 | — | 108 | 1.49 | 0.6 | 3+ | — | 18.2 | | | | | 2.2 |
| | | 5-18-56 | — | 129 | 1.09 | 0.8 | 0 | 0 | 26.3 | | | | | 0.8 |
| | | 5-24-56 | — | 52 | 1.06 | 0.4 | 0 | 0.1 | 16.5 | | | | | 0.6 |
| | | 8-15-56 | 8 | 6 | 1.43 | 0.1 | 2+ | 0.2 | 11.6 | | | | | |

* Acid phosphatase—maximum normal value 1.0 unit.

TABLE 3 (Cont.)
HEPATOBIILIARY DISEASES OTHER THAN INFECTIOUS HEPATITIS

| Patient | Diagnosis and Remarks | Date | SGP-T UNITS | SGO-T UNITS | Serum ChE UNITS | Bilirubin MG/100 ML | Cepb. Flocc. | Thymol Turb. UNITS | Alk. Phos- phatase UNITS | Total Chol. MG/100 ML | % Chol. esters |
|------------------|--|---|---|--|--|---|--|---|---|---|-----------------------|
| DF | Cirrhosis. Deceased this date | 3-31-56 | — | 381 | 1.24 | 4.8 | 3+ | 0.2 | 5.2 | 209 | 55 |
| AV | Cirrhosis | 5-11-56 | — | 58 | 3.56 | 0.2 | 1+ | 0.1 | 9.1 | 304 | 73 |
| LR | Cirrhosis | 10-10-56 | 28 | 77 | 2.25 | 1.8 | 4+ | 1.3 | 10.0 | 213 | 69 |
| SE | Obstructive jaundice with chronic pancreatitis. 6-21-56, cholelithotomy, choledochostomy dilatation sphincter of Oddi. | 6-7-56 6-12-56 6-18-56 6-20-56 6-22-56 6-23-56 6-25-56 6-27-56 7-2-56 | — — — — — — — — — | 139 88 230 82 70 67 93 81 62 | 2.12 2.17 1.96 1.64 1.74 1.42 1.41 1.61 1.33 | 5.1 2.1 2.6 6.4 7.7 5.0 3.3 3.8 2.3 | 3+ 1+ 4+ 2+ 0 2+ 2+ 0 3+ | 2.1 1.3 1.2 1.3 1.4 — 1.0 1.1 1.1 | 24.2 17.5 21.2 22.8 19.2 15.6 13.9 9.5 15.4 | 270 269 212 264 264 — 206 202 185 | |
| FS | Obstructive jaundice with chronic pancreatitis. 1-3-57, cholecystectomy, removal ampulla of Vater. | 12-10-56 12-13-56 12-17-56 12-21-56 12-27-56 1-5-57 1-7-57 1-11-57 | — 192 88 51 58 36 — 35 | — — — — 53 32 — 45 | — 1.81 1.69 1.68 1.50 1.05 0.91 1.13 | 11.1 11.9 14.4 9.6 7.6 7.2 6.8 7.9 | — 0 0 0 1+ 2+ 1+ 1+ | — 0.1 0.3 0.3 0.1 0 0.1 0 | — 24.6 27.2 22.2 22.4 9.0 9.3 13.1 | — 250 350 269 273 160 185 — | |
| SW | Acute cholecystitis, cholelithiasis, choledocholithiasis, cholangitis. Surgery 8-29-56. | 8-27-56 | 75 | 113 | 1.53 | 3.2 | 3+ | 0.3 | 14.2 | 150 | |
| Healthy Controls | | No. Range Mean | 37 5.5- 22.5 12.1 | 77 8.5- 29.2 14.6 | 125 1.50- 3.00 2.32 | 126 0-1.0 0.44 | 100 0-1+ 0 | 108 0-1.0 0.60 | 78 2.15- 10.4 5.48 | 84 149- 361 233 | 84 65- 80 75 |

after toxic effects of the medication were suspected. Serum bilirubin was only slightly elevated in all three. Serum alkaline phosphatase values were about twice normal, and the results of other tests, such as thymol turbidity, cephalin flocculation and cholinesterase, were not remarkable. SGP-T values were elevated 10 to 20 times normal, and SGO-T activities were two to eight times normal. With discontinuation of the drug, transaminase values began to fall rapidly. The patients were not available for further studies during the recovery period.

Patient P.B. with malignant hypertension is, of necessity, maintained on large doses of 1-hydrazinophthalazine hydrochloride (Apresoline). He was admitted to the hospital with toxic hepatitis on June 22, 1956. SGO-T was 451 units at that time. SGP-T activity was not determined. The only other liver function tests indicating abnormality were bilirubin, 1.2 mg/100 ml., and a slight elevation of alkaline phosphatase. SGO-T was within normal limits in five days. Since this episode, the patient has been followed at about monthly intervals by transaminase determinations. In samples in which both SGP-T and SGO-T determinations were done, SGP-T was the more affected.

M.H., a patient at the Winfield State Training School, was under treatment for amebiasis and macrocytic anemia at the time the first biochemical studies were done, October 19, 1956. In addition to the data given in Table 3, serum albumin values are pertinent to the problem. The values were 3.08, 2.71, and 2.40 gm/100 ml. on October 19, November 1, and November 2, respectively. The low serum total cholesterol values, low per cent cholesterol esters and low serum cholinesterase values are further evidence of the chronicity of the liver disease. An abdominal mass with fluid developed. Exploration was undertaken on November 2, but the only procedure carried out was removal of the abdominal fluid. The patient died two days later, and the abdominal mass at autopsy was found to be an amebic abscess of the liver. On the three occasions that serum alkaline phosphatase was measured, the values were moderately elevated. That serum alkaline phosphatase is elevated in amebic abscess of the liver has been reported by Brem.¹⁶ The laboratory data was of no help in establishing a diagnosis in M.H. However, a pattern of elevated alkaline phosphatase and elevated SGO-T and SGP-T activity, without abnormal bilirubin, thymol turbidity, or cephalin flocculation, will be watched for in individuals with amebiasis.

Patient C.B. was admitted to the hospital for diagnosis. The first biochemical studies on May 2, 1956, were compatible with the diagnosis of carcinoma of the prostate. Serum acid phosphatase by

the Fishman method¹⁷ was 17.0 units (maximum normal is 1.0 units). Alkaline phosphatase was also elevated to 22.9 King-Armstrong units. SGO-T was only slightly elevated with an initial value of 42. It seemed advisable to learn if the growth was hormone dependent. To determine this, the sex-hormone stimulation test as outlined by Emerson and Jessiman¹⁸ was carried out. The results are assessed by observing the increase in urine calcium excretion and the worsening of subjective symptoms. It was in conjunction with this test that testosterone was given. The results of the test were positive, and bilateral orchiectomy was done on May 11. There was a steady increase in SGO-T activity from the time of admission to the hospital on May 1 to a peak value of 129 units on May 18. Serum cholinesterase was steadily falling as SGO-T rose. Serum acid and alkaline phosphatase started to fall the day after orchiectomy. SGO-T did not drop until after stilbesterol was given. The extent of liver invasion by the malignancy cannot be determined, but the results are given as they may illustrate the value of SGO-T in following a disease in which there may be liver involvement.

Patient D.F. had liver cirrhosis and acute gastric ulcer with hemorrhage for 52 hours before surgery. He died in hepatic coma a short time after gastrectomy. About an hour before death, the serum SGO-T was 381 units. Since no biochemical data is available on this patient before this terminal sample, nothing can be said as to the progression of the disease. Data on the other two patients with cirrhosis, A.V. and L.R., are also meager. Studies in both patients were made at the time when they were recovering from alcoholic bouts. SGO-T values are moderately elevated in each patient. Only in patient L.R. are both SGO-T and SGP-T values available, but in this patient SGO-T was a better index of liver damage than SGP-T.

The last three sets of data in Table 3 are from patients with obstructive jaundice. S.E. was followed pre- and post-surgically by SGO-T and the other tests shown. The pre-operative chemical picture was confused, with thymol turbidity above normal, cephalin flocculation values from 1 plus to 4 plus, and serum total cholesterol values erratic. SGO-T values varied before surgery from 230 to 82 units. These values are much lower than those found in patients with hepatitis. After surgery, SGO-T levels gradually fell. Follow-up studies were not possible after the patient was dismissed from the hospital.

Patient F.S. came under observation earlier in his illness than the patient just discussed. He was followed pre-surgically by SGP-T and the other liver function tests. SGP-T was moderately elevated on admission to the hospital. This moderate elevation of SGP-T to 192 units, along with a bilirubin value

of 11.9 mg/100 ml., negative cephalin flocculation, normal thymol turbidity, and elevated alkaline phosphatase level (24.6 units), is more suggestive of obstructive jaundice than it is of hepatitis. The increase in total cholesterol from 250 to 350 mg/100 ml. in a four-day period at the beginning of the illness was further suggestion of an obstruction in the biliary tract. On January 3, 1957, the patient underwent cholecystectomy, and the ampulla of Vater was removed to relieve the obstruction. No evidence of stones or malignancy was found. It is too early after surgery to have the recovery data, but the obstruction was proved and the findings thus far are of value as they illustrate the relatively slight increases in SGO-T and SGP-T as compared to those observed in infectious hepatitis. Only pre-surgical data is available on the third patient, S.W., but it too illustrates the relatively small increase in transaminase values in obstructive jaundice. SGO-T value is higher than SGP-T.

In our attempt to learn at first hand the type of pathology likely to affect SGO-T, we measured the activity in one serum sample from an accident patient in whom there had been extensive loss of brain tissue. The value observed was 249 units. The patient died a short time after the blood sample had been drawn. Studies on spinal fluid were not done but would have been of interest.

Discussion

Our first use of SGO-T determinations was in patients with definite or suspected myocardial infarctions. Compared with normals, the moderately elevated SGO-T values of 60 to 100 units obtained 12 to 24 hours after the infarctions were striking. We felt confident in our first suspected cases that there had not been an infarction when normal activity was found 12 to 24 hours after the questionable attack and the electrocardiograms and other diagnostic tests were normal. With continued use of the determinations, we are satisfied that elevations do occur 6 to 12 hours after myocardial necrosis. The serum activity falls to normal two to five days after the accident. This is in agreement with the observations of LaDue and Wroblewski,¹ Steinberg and Ostrow,³ Katkus, Watanabe, Semenson, and Drell.¹⁹ However, in some patients, it is difficult to estimate the time of infarction with sufficient accuracy to be certain the blood is drawn at the right interval after the attack to catch the peak value. If an elevated value is found, along with other positive diagnostic signs, a diagnosis of acute myocardial infarction may be made with more confidence. However, we have little assurance in a normal value as an indication of

the absence of an infarction. This drawback is stressed by White.²⁰

The great increase in SGO-T and SGP-T activity and the gradual return to normal with recovery in infectious hepatitis are, by far, the most striking biochemical changes observed in our 10 patients with this disease. Our observations are in agreement with those of Wroblewski and LaDue,^{4, 5, 7, 8} Chinsky, Shmagranoff, and Sherry,² and White.²⁰ By the use of serial determinations of serum transaminase, diagnosis and management of hepatitis should materially improve.

Our experiences with the use of SGO-T and SGP-T tests in other diseases of the hepatobiliary system are too limited to elaborate on which of the two enzymes is more sensitive to the particular pathologic process. However, what data we do have agrees with the observations of Wroblewski and LaDue.⁸ The sensitivity of SGO-T and SGP-T to the undesirable side effects of some drugs, as chlorpromazine, is proving a valuable means of early detection of toxicity.

In view of our observation of elevated SGO-T in the patient with brain damage, a paper by Wakim and Fleisher²¹ should be mentioned. They produced experimental cerebral infarctions in dogs. They observed a marked increase in glutamic oxalacetic transaminase in the cerebrospinal fluid which reached a peak about 100 hours after the infarction and returned to normal in 15 days. The increase was proportional to the severity and extent of the cerebral infarction. In most dogs there was also an increase in the serum enzyme, but the value was not so good an index to brain damage as the cerebrospinal fluid value.

Summary

We have reported some results of SGO-T and SGP-T determinations in patients with acute myocardial infarctions and diseases of the hepatobiliary system.

SGO-T activity is moderately elevated after necrosis of the myocardium. The serum level does not increase until four to six hours after the attack and usually returns to normal in two to five days. That the elevated SGO-T value persists for such a short time limits the usefulness of the test as a diagnostic aid and as a guide to therapy.

SGO-T and SGP-T determinations were greatly elevated in our 10 patients with infectious hepatitis, SGP-T being more affected than SGO-T. With recovery, the serum transaminase values gradually return to normal and the changes in SGP-T (or SGO-T) more nearly fit the state of recovery of the pa-

tient than any of the other biochemical liver function tests. SGP-T seems to be a sensitive test for toxic hepatitis, as can occur from some medications.

In three patients with obstructive jaundice, SGO-T and SGP-T were moderately elevated. More data is needed before we can assume the usefulness of transaminase determinations in differentiating between hepatocellular and obstructive jaundice, but our preliminary results are encouraging.

All other diseases of the hepatobiliary system studied showed moderate elevation in SGO-T and/or SGP-T. Our series included patients with cirrhosis, amebic abscess of the liver, and infectious mononucleosis with liver involvement.

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The average man on the street needs to know more science today than the teachers knew a generation ago, just to be able to read his newspapers and magazines intelligently. Music, art—those possessions formerly of the fortunate few—now belong to the people. Whatever field of subject matter you name—its content and significance for modern living has doubled, trebled . . . in recent years!

—Alexander J. Stoddard

Toxic Psychosis

A Complication of Overdosage of Anti-Obesity Drugs

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For more than 50 years thyroid preparations have been used in the treatment of obesity, and since 1935 amphetamine has been used for the same purpose. Though it is well known that either of these drugs taken in sufficient quantities may produce signs of "nervousness," a review of the literature reveals that few references are made to the development of "nervousness" to a psychotic degree. In the patient reported, intoxication with thyroid extract and amphetamine occurred in the treatment of obesity, the intoxication precipitating a psychosis.

Case Report

The patient is a 33-year-old divorced woman from a small midwestern city. She voluntarily referred herself to the Topeka State Hospital for treatment. During the preceding five months she had noticed increasing lack of control over her temper, extreme anxiety and tension, and fear that she might do something to harm other people or herself.

The patient's mother, an extremely domineering, over-religious, hostile, rejecting person, was the family disciplinarian, administering frequent beatings to her children. In contrast, the father, a kindly, quiet, gentle man, was always good with the children. The patient is said to have had an exceptionally bad temper all her life, but between times was a pleasant, kind, gentle girl. The mother always considered her as difficult to reason with and said that she never had had her daughter under control. The patient had an intense hatred of her mother, but she never fought back for the beatings she received. She was considered "dumb" by her teachers and quit school in grade seven at 15. During her teens she ran away from home frequently and had two illegitimate pregnancies.

She married at age 22, but her husband was soon incarcerated in a penitentiary for forgery. Following his imprisonment, she lived with him until he was again sentenced to the penitentiary, at which time she divorced him. At this time she was 30 years old.

All her life she had been a heavy eater, and approximately four years before admission to the hospital she had consulted her family physician for treat-

ment of obesity, as she weighed close to 300 pounds. She was given a diet and a prescription for reducing tablets. The tablets were of three kinds, to be taken at different times of the day. The before-breakfast tablet contained meth-amphetamine hydrochloride 10 mgm., thyroid extract gr. 1, atropine gr. 1/360, and alloin gr. 1/4. The before-lunch tablet contained the same ingredients as the first, except that the alloin was omitted. The 4:00 p.m. tablet contained meth-amphetamine 10 mgm., thyroid extract gr. 1, and phenobarbital gr. 1/4. After about 18 months her weight had dropped to 170 pounds. She tried stopping the tablets temporarily but found that she immediately gained weight, so she continued taking the tablets regularly three times daily till her admission to the hospital.

In the case reported, the patient suffered toxic psychosis as a result of the combination of Bensedrine and thyroid administered in treatment of obesity. The literature is briefly reviewed.

About one year prior to her admission she began to notice slight heat intolerance, mild weakness, fatigability, and palpitation. Gradually and insidiously these symptoms became more pronounced, and she began to notice "nervousness," tremulousness, and feelings of tension.

Five months prior to admission she was operated on for removal of a small tumor of the buttock, under local anesthesia. The tumor was more difficult to remove than the surgeon had expected, and during the latter part of the operation the effect of the anesthetic had worn off, so the surgical manipulations caused her considerable pain. In addition, her convalescence was prolonged because of poor healing. During the convalescence the nervous symptoms suddenly became heightened and continued to increase in severity from that time forward. She became extremely anxious and tense, and the heat intolerance became severe. The slightest effort would cause her to sweat freely. Palpitation, shortness of breath on exertion, and generalized weakness became intensified, and severe insomnia appeared.

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About this time a friend noted that occasionally she would "talk to herself." Once she went over to the corner of her room and talked to an imaginary person. On another occasion she imagined that there were prowlers in her room. Following these events the patient had no recollection of them.

Her violent temper became vicious and almost uncontrollable. Though she had previously been deferential to her mother to the point of obsequiousness, on one occasion she struck her mother. Though she professed to love her boy friend, about two months prior to admission she threatened to kill him with a knife. Immediately following these outbursts, she felt guilty and was frightened to think that such impulses could gain control over her. She became mildly depressed and talked about the possibility of suicide. Her symptoms increased in severity. She began to feel that she should enter a mental hospital and receive treatment, so she had herself committed.

Physical examination showed a stockily built woman who appeared older than her 33 years. She was 5 feet 6 inches tall and weighed 176 pounds. Extreme anxiety, tension, and heat intolerance were evident. Even in a cool room her body was constantly covered with sweat. Her hands were warm and moist. She could walk up and down steps with difficulty, breathing heavily. The extended hands showed a fine fast tremor. The eyes were staring and bright, blinking was infrequent, and a marked degree of lid-lag was present. A mild degree of exophthalmos was present bilaterally. The pupils were widely dilated. The pulse varied between 92 and 104, and the blood pressure was 154/90. The thyroid gland was of normal size.

X-rays of the upper sternal area showed no evidence of an enlarged retrosternal thyroid gland. Blood cholesterol was 260 mgms. per cent. Basal metabolism readings showed results of -14 and $+2$. Blood Wassermann was negative. Red blood count was 5,400,000, white blood count 8,500, diff. polys 58 per cent, lymphs 42 per cent. Routine urinalysis was essentially normal.

Psychiatric examination showed an extremely anxious, tense, apprehensive woman with a marked startle-reaction. Irritability was pronounced, along with frequent lapses into tears, followed by apologies for her lack of emotional control. She exhibited rage reactions at any fancied slight, out of all proportion to the stimulus. If a letter from her boy friend didn't arrive on the day that she expected it, she would be plunged into depression and would think that he no longer cared for her, that he had found someone else, and so forth. At the receipt of a letter, all these feelings would disappear and she would be "on top of the world." She had a most intense fear that she

might do some harm to others, as she knew that her temper was almost beyond control.

The drugs, however, were withdrawn on her arrival (she had even taken a tablet in the morning, before being admitted). In the ensuing three weeks, the change in her symptoms and signs was dramatic. During this time the heat intolerance, sweating, extreme anxiety, insomnia, tension, weakness, tachycardia, hypertension, and eye signs all but disappeared. She asked to be allowed to work on the ward, and she performed the work easily and efficiently. Blood pressure was 120/70, and the pulse was 70. The emotional lability continued, but in an attenuated form.

Psychological tests three weeks after admission showed immaturity, dependency, orality, denial, evasion, strong repressive tendencies, and inability to tolerate anxiety. There were evidences of perceptual and motor disturbances which could be accounted for on the basis of high tension and/or mild organic brain involvement.

About six weeks after admission she was dismissed from the hospital at her own request. Symptoms and signs of the toxic state had disappeared. Though outpatient follow-up was recommended on discharge, she did not come back for further interviews after leaving the hospital.

Review of the Literature

Much has been written in medical literature regarding the use and abuse of thyroid extract and amphetamine in the treatment of obesity. MacBryde¹ stated that thyroid should be employed only when definite hypothyroidism is present, and then only in amounts sufficient to maintain a normal metabolic rate. Goodman and Gilman² question whether it is desirable to produce the symptoms of hyperthyroidism by the use of thyroid when the end result of weight reduction can be obtained by restricting the calorie intake. Moller,³ Brunn,⁴ Lous,⁵ and Anderson⁶ present a number of cases of thyrotoxicosis which developed following the use of thyroid extract and which did not recede on the removal of the drug. Many of the patients had been given thyroid extract as treatment for obesity. These authors warned that thyroid gland preparations should not be prescribed as a remedy against obesity.

Benzedrine has long been known to have an inhibitory effect on appetite, and MacBryde¹ advocates its use in helping patients control their appetites, giving benzedrine sulphate 5 to 10 mgms. before breakfast and lunch, but not in the afternoon since it causes insomnia.

Goodman and Gilman² state that the main results of oral administration of 10 to 30 mgm. of ben-

zedrine are a temporary increase in efficiency, confidence, alertness, and initiative, and elevation of mood, euphoria, elation, lessened fatigue, enhanced motor and speech activity, increased ability to concentrate, irritability, and sleeplessness. They warn, however, that the effects are not always as described, and many patients may complain of headache, palpitation, dizziness, and vasomotor disturbances, or manifest agitation, delirium, depression, or fatigue. Larger doses are always followed by fatigue and mental depression. The reversal of central effects may also follow the continued use of moderate doses. It was noted that restlessness, tremors, insomnia, talkativeness, and irritability are common. Confusion, assaultiveness, hallucinations, delirium, panic states, and suicidal or homicidal tendencies have also been observed, especially in mentally ill patients. They warn that benzedrine should be used with caution in patients with psychopathic personalities and with a history of homicidal or suicidal tendencies. In overdosage,⁷ chills, collapse and syncope were noted.

Among the cases of psychosis reported, Norman and Shea⁸ report the occurrence of hallucinations, delusions, agitation and resistiveness in a 49-year-old man who had been addicted to benzedrine sulphate for five years. Previous to that, he had been addicted to alcohol. The authors stress that the patient, previous to the addiction, had shown many neurotic traits. The acute psychotic experiences disappeared in about four weeks after cessation of the drugs.

Young and Scoville⁹ describe three cases of paranoid psychosis occurring in narcolepsy, two of which appeared to be precipitated by the use of benzedrine. They felt that a careful psychiatric examination is indicated before starting benzedrine therapy on narcoleptic patients, and that if a paranoid trend is discovered, it may be wiser to allow the sleeping spells to continue.

Monroe and Drell¹⁰ report on the oral use of benzedrine from inhalers and note four cases of ideas of reference and hallucinations occurring in the users. They stress that the psychoses exhibited were extensions of latent paranoid trends, and that benzedrine accentuated the trends and resulted in overt psychosis. The symptoms subsided with discontinuance of the drug.

Wallis, McHarg, and Scott¹¹ report a case of acute psychosis caused by the ingestion of 55 mgm. of dextroamphetamine (the dextrarotatory isomer of racemic amphetamine). There were auditory and visual hallucinations, which disappeared in two days. V. Nandestadh¹² reports a case of psychosis with paranoid delusions in a man who had been addicted to benzedrine for two years. The psychosis disappeared three days after he entered the hospital.

On the other hand, there are reports which indicate that benzedrine may be taken for long periods of time without harm. Bakst¹³ reports the case of a man suspected of having narcolepsy, who had been taking 15 to 30 mgm. of benzedrine sulphate daily over a period of approximately nine years. No remarkable effects of the long-continued dosage of the drug could be demonstrated, nor were any perceptible changes noted when the drug was discontinued. Bloomberg¹⁴ found the same results in three patients with narcolepsy who had been taking 70 mgm. or more of amphetamine sulphate daily for 32 months in two cases, and 20 months in one case.

Pelner¹⁵ used a combination of drugs, similar to that used by the woman in the case report above, but each patient was under careful control. He found that after a few months the patient invariably developed tolerance to the drugs and became refractory to benzedrine and atropine. If stopped for about two weeks, the drugs could be started again in smaller doses. He noticed only minor side-reactions and these were rare.

The writer, in perusing the literature, has not been able to find a single case in which both thyroid extract and benzedrine were used simultaneously for the treatment of obesity and which led to the development of a toxic psychosis.

Discussion

It is evident from the case history presented that the patient had had many longstanding personality difficulties prior to the intoxication with benzedrine and thyroid extract, but that the drugs served to expose latent psychotic tendencies. Though the removal of the drugs caused the overt physical and psychotic manifestations to recede, her potential for psychosis still remained. This observation is in accord with that of others who have observed similar toxic psychoses, in that latent psychotic potentials became manifest. The drugs seemed to have the effect on our patient of over-stimulation, both physically and emotionally, at the same time decreasing the patient's ability to control the expression of latent psychotic tendencies.

It would seem, from the above case report, that there is considerable danger in the use of thyroid extract and amphetamine in the treatment of obesity when the patients are not under careful supervision, and particularly when they show emotional instability and maladjustment prior to the administering of the drugs.

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Stuttering in Childhood

Concepts of Therapy and Results of Research

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Among the more perplexing problems seen by the general practitioner and specialist is the child who stutters. Customarily a parent of such a child reports having been advised by her doctor to ignore the problem. That this represents far from the optimal solution is reflected by the countless children who continue to stutter in spite of absolute compliance by the parents with this advice. Likewise advice from relatives or neighbors for the child to talk slower, to think before he talks, or to take a deep breath is generally useless. The problem is such that it cannot be ignored by even a well adjusted parent. Adequate treatment by the physician involves knowledge of present research concerning the problem, sources for adequate referral, and acceptance of the patient's complaint as being important.

There have been countless theories and explanations of stuttering for literally thousands of years. Yet today we are essentially confused as to the etiological agent or agents involved. As with most enigmas, proponents of both the psyche and the soma, not to mention those individuals who are a hybrid of both, have advanced proposals. Today, with regard to children who stutter, the ideas of Dr. Wendell Johnson of the University of Iowa have attained the most acceptance. Johnson believes that stuttering in mid and late childhood is related

to the child's developmental environment. Studies of children's speech by Davis indicate a wide range of non-fluency. Johnson feels that during childhood there is a possibility for parents to mislabel this

Today's best results in correction of stuttering are achieved by a combination of psychotherapy and speech therapy. It is unlikely that a patient more than six years of age will grow out of this speech difficulty.

normal non-fluency. The child in turn internalizes this label of stuttering and subsequently acquires the stigma and emotional reactions attendant to the label. By the time of the sixth birthday this non-fluency has usually disappeared in most children. Upon this observation the rationale of not directly treating the stuttering of children in their early years is based.

However, after the child has reached six years of age, the advisability of telling his parents that he will grow out of his difficulty becomes questionable. For it is at this time that the child leaves the home environment and encounters in educational experiences an emotional environment which is not

as understanding as that of the home. Of course the issue is additionally clouded when the patient's home environment is not satisfactory in the beginning.

The numbers of those who have felt the problem to be physiologically based have decreased in recent years. Yet the questions raised by Kopp in his study of the blood chemistry of stutterers, and Orton and Travis in their considerations of cerebral dominance, have not been completely dismissed. Earlier concepts studied and proposed before the advent of present rigorous methodological procedures are currently being re-evaluated.

When a patient is between the ages of 6 to 12, professional help from a speech pathologist can sometimes aid in an early alleviation of the problem. While controversy is present over the basic treatment of the problem among analytically and non-analytically oriented individuals, probably the best results are obtained in those therapies which combine both psychotherapy and speech therapy. As most speech therapists are now oriented, the two approaches are not basically different. In fact overall subgoals and goals of the two are quite similar. Present psychological research does not demonstrate that stuttering in children is the result of nervousness. It does show that many of the extraneous mannerisms commonly seen in the stutterer are his reactions to having difficulty in speaking.

It is most helpful in terms of future rehabilitation if the parents are merely acquainted with available

knowledge and the prognosis for their child's rehabilitation. The following statements summarize present research on this problem:

1. More boys than girls stutter. The ratio is approximately 4:1.

2. More of the Caucasian than of the Negro race stutter.

3. Approximately .7 of the population of the United States stutter.

4. It is impossible for the speech pathologist to predict from clinical tests who will make progress in therapy.

5. Stuttering does not occur involuntarily in singing or choral reading. It occurs rarely when talking to animals.

6. There is no one superior method for treatment of the problem.

7. Onset is generally seen prior to adolescence.

8. Perhaps the most consistent fact about the phenomenon is its inconsistency.

If a referral is made to a speech pathologist, it is best to make sure the therapist is a qualified individual as defined by the American Speech and Hearing Association. Referral to clinical psychologists registered with the American Psychological Association is also helpful.

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

The economy drive to the contrary notwithstanding, health spending by the Department of Health, Education, and Welfare for the fiscal year that began this July already is assured of surpassing last year's record by some \$33 million. This assumes, of course, that no further requests will be made by HEW for supplemental funds, a practice common in government for many years.

Research programs were the most favored by legislators, many of whom spoke out against federal spending by other agencies. But when the health budget came up for debate, the economy oratory subsided.

In only one instance was a health program cut back. And to the surprise of many, it occurred in the Senate which traditionally restores budget cuts originating in the House. A sum of \$45 million was voted, instead of the House-approved \$50 million, for grants to states for sewage treatment works construction. But then the Senate wrote in language permitting states to get their maximum allotments a full year after the fiscal year ends.

The Hill-Burton hospital construction program received \$3.8 million less than last year but only because the administration asked for \$121.2 million instead of the \$125 million appropriated last year.

The National Cancer Institute received the largest dollar increase of any health item in the budget. The increment was \$8 million over last year. The administration had asked for \$48.4 million, the House voted \$46.9 million, and the Senate raised this to \$58.5. It was finally compromised at \$56.4 million.

Congress obviously agreed with the views expressed by the Senate Appropriations Committee: "... the committee is fully aware that it is providing funds for cancer research, the outcome of which is unknown. On the judgment of those who are scientifically most competent, the committee is fully willing to risk the investment on the ground that the chance of a big payoff is a reasonable one. Such risks are inherent in research."

The Institute of Arthritis and Metabolic Diseases fared well, too, getting a total of \$20,385,000 compared with last year's \$17,885,000. And the Senate Committee charged the institute with taking leadership in research on effects of radiation on the human organism.

The Mental Health Institute's spending has been going steadily upward, and this year it was given another boost with a final appropriation of \$39,217,000, an increase of about \$4 million. Other research totals for the current year: National Heart Institute, \$35,936,000; Neurology and Blindness Institute, \$21,387,000; Allergy and Infectious Disease Institute, \$17,400,000.

On only one score did the research advocates lose out. The House view prevailed in conference on the setting of a 15 per cent ceiling on additional overhead costs allowed schools and other institutions getting federal grants. This question which drew considerable attention in hearings is likely to be reopened. Congress wants a General Accounting Office study by the end of this year.

In voting a \$5 million increase (to \$22,592,000) for general public health assistance to the states, Congress was reaffirming its support of helping local health departments increase their professional staffs and broaden their services. The Senate Committee report contained this significant language: "... with a population increase of more than 20 million during the past decade, there are no more organized health departments than there were 10 years ago. This means that 18 million people are living in areas with no full-time organized community health services, and millions more live in areas where such services are only fragmentary."

A few days later, the Public Health Service announced plans for a broad survey of rural health needs, particularly in sparsely settled areas. It picked for its first study Kit Carson County, Colorado, an area known for its scattered farm population, low income level, and adverse climatic conditions.

Capital Notes

The President has signed into law a two-year revision of the doctor draft law permitting selective call-up of physicians to age 35 if they were deferred from regular draft service to complete professional training. . . . The poliomyelitis vaccine act expired July 1 with all but \$400,000 of \$53.6 million taken up by states for inoculation programs. An estimated 29 million children and pregnant women received 70 million injections. . . . The Public Health Service has conferred with the American Medical Association on medical manpower plans in event of an epidemic of the new Far East influenza. . . . The National Library of Medicine no longer is lending books and other material over the counter to individuals; requests must be channeled through other libraries. . . . The administration bill on federal workers' health insurance has been introduced; it combines both basic and major medical coverage.

PRESIDENT'S PAGE

Dear Doctor:

The State Board of Healing Arts has been duly appointed, the culmination of years of study, negotiation, and careful planning. On this board will be focused the close attention and great interest of our entire profession and the close scrutiny of other states faced with similar problems. Successful implementation and enforcement of the Healing Arts Act are dependent upon the wisdom and decisions of the board. Therein lies a tremendous responsibility.

The Kansas Medical Society, having played so large a part in development of the act and in the negotiations with related branches of the healing arts, has a large stake in the future of the board. The Society is convinced that we have a sound law which will properly regulate health practice in Kansas. We can conceive only of successful accomplishment of its purposes.

The osteopathic and chiropractic appointments to the board are most gratifying. The three osteopathic appointees gave full cooperation and worked diligently for the bill in the legislature. They will unquestionably continue to give full cooperation. By fortunate circumstance, the three chiropractic members are from a segment which has earnestly expressed the desire to achieve a smoothly functioning board. Unfortunately, radical elements of their association, those who opposed so viciously in the legislature, are now bitterly attacking the act. They attempted to block the chiropractic appointments and are attacking constitutionality of the act in the courts. However, there is assurance from competent legal advisers that this action will be as futile as were their efforts to stop the appointments by a restraining order.

The five doctors of medicine were appointed by the governor from a list carefully prepared with aid and advice of the Council, the executive committee, past presidents, and a group of interested members. Careful consideration was given to all factors that appeared to influence the composition of a good board. We have confidence in those appointed. They are competent, conscientious, loyal members of our profession. They have undoubtedly familiarized themselves with the details of the act and will shortly partake in preparation of regulations and routines of procedure.

There is extremely keen disappointment that the governor did not see fit to appoint at least one or two members of the retiring board. It is time-honored practice to maintain some continuity on boards and standing committees, to utilize knowledge, experience, familiarity with routine and details which can come only by active participation. The tasks of the board will be immeasurably more difficult; progress and efficiency will be much delayed; there will be many things learned only by making unfortunate mistakes, mistakes which past experience would obviate. However, our board members, being men of intelligence and good judgment, will surely comprehend this and will not fail to turn for counsel to their friends who have served and learned by having met the board's intricate problems again and again.

Fraternally yours,

A handwritten signature in dark ink, reading "Daniel A. Nelson". The signature is fluid and cursive, with a large initial "D" and a stylized "N".

President

EDITORIAL COMMENT

The Healing Arts Act

As of July 1, the practice acts governing medicine, osteopathy, and chiropractic in the state of Kansas were repealed and a new healing arts board, composed of members of each of those professions, replaced the three previous boards. Below is a summary of the most important sections from the 92 sections comprising the new Healing Arts Act.

SECTION 1. Recognizing that the practice of the healing arts is a privilege granted by legislative authority and is not a natural right of individuals, it is deemed necessary as a matter of policy in the interests of public health, safety and welfare, to provide laws and provisions covering the granting of that privilege and its subsequent use, control and regulation to the end that the public shall be properly protected against unprofessional, improper, unauthorized and unqualified practice of the healing arts and from unprofessional conduct by persons licensed to practice under this act.

SECTION 2. The healing arts include any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, or injury, and includes specifically but not by way of limitation the practice of medicine and surgery; the practice of osteopathy; and the practice of chiropractic.

SECTION 4. No person shall be licensed under this act until he shall have furnished satisfactory evidence to the board that he has attained the age of 21 years, is of good moral character, and a citizen of the United States.

In Sections 9, 10, and 11 the act states that licenses expire on June 30 of each year and may be renewed without examination. If renewal is not accomplished within 30 days thereafter, the license shall be suspended until an additional fee of five dollars has been paid. After 90 days, a revocation order shall be issued, and reinstatement can be accomplished only upon recommendation of the board. The license shall be recorded in the office of the county clerk of the county in which the practitioner practices or resides and, if all other requirements have been met, one temporary permit may be issued prior to the issuance of a regular license.

Beginning with Section 12 the act provides that the governor shall appoint a healing arts board consisting of five members who hold a degree of doctor of medicine from an accredited medical school and shall be residents of Kansas and have been actively

engaged in the practice of medicine and surgery in the state of Kansas under licenses issued in this state for a period of at least six consecutive years immediately preceding their appointment. Three shall be osteopathic physicians and three chiropractors, each with similar residence requirements. Appointments after the first time shall be for four years, and no board member may serve more than three consecutive terms. Each shall serve until his successor is appointed and qualified. The governor shall appoint from a list of three names for each vacancy submitted by the professional society involved.

The board shall elect officers, accredit colleges, employ a secretary at a salary of not more than \$3,000, and shall have seven persons present at each meeting for a quorum.

SECTION 26. The sessions for the purpose of giving examinations shall be held at such times and places as the board may fix and not to exceed four in any one year.

SECTION 29. All examinations shall be in writing, and the identity of persons taking the same shall not be disclosed upon the examination paper in such a way as to enable the board to know by whom written.

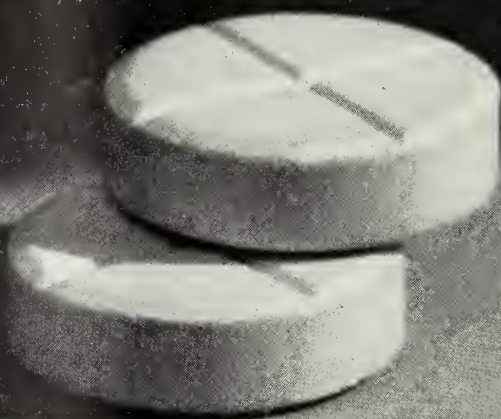
SECTION 30. The examination under this act shall be prepared, given, and graded by members of the board who hold a license similar to that sought by the applicant.

Licenses may be issued by endorsement, as described in Section 33, if the applicant holds a license in some other state where their individual qualifications meet the Kansas legal requirements and he has been in active practice in the previous state not less than one year.

SECTION 36. A license may be revoked or suspended when the licensee is guilty of any of the following acts or offenses: (a) Fraud in securing the license. (b) Immoral, unprofessional or dishonorable conduct. (c) Conviction of a felony. (d) Use of untruthful or improbable statements or flamboyant, exaggerated or extravagant claims in advertisements concerning such licensee's professional excellence or abilities. (e) Use and distribution of literature advertising professional abilities. (f) Other unethical advertising practice. (g) Addiction to or distribution of intoxicating liquors or drugs for any other than lawful purposes. (h) Willful or repeated violation of this act or the rules and regulations of the state board of health. (i) Unlawful invasion of the field of practice of any branch of the healing arts in which the licensee is not licensed to practice. (j) Failure to pay annual renewal fees specified in this act. (k) Failure to take some form of postgraduate work each year as required by the board.

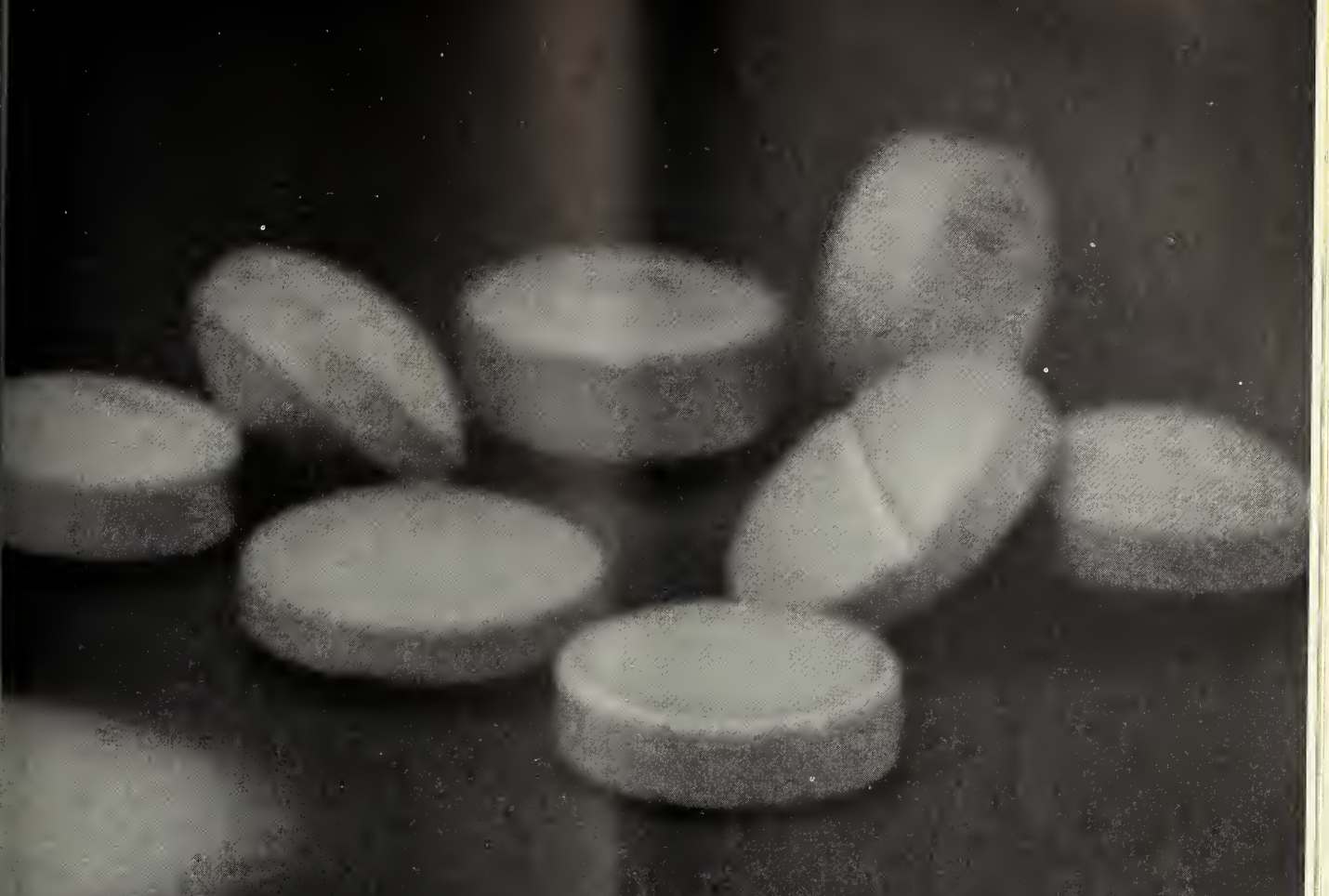
SECTION 37. For the purpose of the preceding section, "unprofessional conduct" shall consist of any of

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(1) Boger, W. P.; Strickland, C. S. and Gylfe, J. M.: *Antibiot. Med. & Clin. Ther.* 3:378 (Nov.) 1956.

*Reg. U.S. Pat. Off.

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the following acts: *(a)* Solicitation of professional patronage, or profiting by the acts of those representing themselves to be agents of the licensee. *(b)* Receipt of fees on the assurance that a manifestly incurable disease can be permanently cured. *(c)* Assisting in the care or treatment of a patient without the consent of said patient, his attending physician or his legal representatives. *(d)* The use of any letters, words, or terms, as an affix, on stationery, in advertisements, or otherwise indicating that such person is entitled to practice a branch of the healing arts for which he is not licensed. *(e)* Performing, procuring or aiding and abetting in the performance or procurement of a criminal abortion. *(f)* Willful betrayal of confidential information. *(g)* Making use of any advertising statements of a character tending to deceive or mislead the public. *(h)* Advertising professional superiority or the performance of professional services in a superior manner. *(i)* Advertising prices for professional service. *(j)* Advertising by means of a large display, lights, signs, or containing as a part thereof, the representation of any portion of the human body. *(k)* Employing or making use of advertising solicitors or free public press agents. *(l)* Advertising any free professional services or free examination. *(m)* Offering discounts or inducements to prospective patients by means of coupons or otherwise to perform professional services during the given period of time or during any period of time for a lesser or more attractive price. *(n)* Advertising to guarantee any professional service or to perform any operation painlessly. *(o)* Individually advertising any price or prices of corrective devices or services.

The 30 sections following deal with proceedings for suspension and revocation of licenses and spell out procedures necessary to enforce the act and the penalties that may be assessed by the courts for various violations.

SECTION 68. For the purpose of this act the following classes or persons shall be deemed to be engaged in the practice of the healing arts: Persons who hold themselves out to the public as being engaged in or who maintain an office for the practice of the healing arts as defined in section 2 of this act.

SECTION 69. For the purpose of this act the following classes or persons shall be deemed to be engaged in the practice of medicine and surgery: *(a)* Persons who publicly profess to be physicians or surgeons or publicly profess to assume the duties incident to the practice of medicine or surgery or any of their branches.

(b) Persons who prescribe, recommend or furnish medicine or drugs, or perform any surgical operation of whatever nature by the use of any surgical instru-

ment, procedure, equipment, or mechanical device for the diagnosis, cure or relief of any wounds, fractures, bodily injury, infirmity, disease or illness of human beings.

(c) Persons who attach to their name the title M.D., surgeon, physician, physician and surgeon, or any other word or abbreviation indicating that they are engaged in the treatment or diagnosis of ailments, diseases or injuries of human beings.

In Section 70 the osteopathic physician is defined by the definition hitherto made by the Supreme Court of this state.

SECTION 71. For the purpose of this act the following classes or persons shall be deemed to be engaged in the practice of chiropractic: (1) Persons who examine, analyze and diagnose the human living body, and its diseases by the use of any physical, thermal or manual method and use the x-ray diagnosis and analysis taught in any recognized chiropractic school; and (2) persons who adjust any misplaced tissue of any kind, or nature, manipulate, or treat the human body by manual, mechanical, electrical or natural methods or by the use of physical means, physiotherapy (including light, heat, water or exercise), or by the use of foods, food concentrates, or food extract, or who apply first aid and hygiene, but chiropractors are expressly prohibited from prescribing or administering to any person medicine, or drugs in materia medica, or from performing any surgery, as hereinabove stated or from practicing obstetrics.

SECTION 72. The practice of the healing arts shall not be construed to include the following classes or persons: *(a)* Persons rendering gratuitous services in the case of an emergency.

(b) Persons gratuitously administering ordinary household remedies.

(c) The members of any church practicing their religious tenets provided they shall not be exempt for complying with all public health regulations of the state.

(d) Students while in actual classroom attendance in an accredited healing arts school who after completing one year's study treat diseases under the supervision of a licensed instructor, or while serving an internship or residency in an accredited hospital.

(e) Students upon the completion of at least three years study in an accredited healing arts school and who, as a part of their academic requirements for a degree, serve a preceptorship not to exceed 90 days under the supervision of a licensed practitioner.

(f) Persons who massage for the purpose of relaxation, muscle conditioning, or figure improvement, provided no drugs are used and such persons do not hold themselves out to be physicians or healers.

(g) Persons whose professional services are per-

formed under the supervision or by order of or referral from a practitioner who is licensed under this act.

(b) Persons in the general fields of psychology, education and social work, dealing with the social, psychological and moral well-being of individuals and/or groups provided they do not use drugs and do not hold themselves out to be physicians, surgeons, osteopathic physicians or chiropractors and provided that the state of Kansas does not license their professional activities.

(i) Practitioners of the healing arts in the United States army, navy, air force, public health service, and coast guard or other military service when acting in the line of duty in this state.

(j) Practitioners of the healing arts licensed in another state when and while incidentally called into this state in consultation with practitioners licensed in this state, or residing on the border of a neighboring state, duly licensed under the laws thereof to practice a branch of the healing arts, but who do not open an office or maintain or appoint a place to regularly meet patients or to receive calls within this state.

Dentists, optometrists, nurses, podiatrists, and pharmacists, when practicing their professions, are not included in the provisions of this act.

SECTION 73. (a) Each applicant for a license by examination to practice any branch of the healing arts in this state shall: (1) present proof that he is a graduate of an accredited high school. (2) Present to the board a certificate of ability in anatomy, physiology, chemistry, bacteriology, and pathology issued by the board of basic science examiners of this or any other state, or territory, or of the District of Columbia. (3) Present proof that he is a graduate of an accredited healing arts school or college. (4) Pass an examination prescribed and conducted by the board covering the subjects incident to the practice of the branch of healing arts for which the applicant applies.

(b) Any person seeking a license to practice medicine and surgery shall present proof that he has completed an acceptable internship as the board shall require.

Also in this section is included a provision that osteopaths practicing in Kansas as of January 1, 1957, or who have graduated from an accredited college of osteopathy after June 1, 1950, may take an examination in medicine and surgery and, if successful, shall be given a license entitling them to perform surgery with instruments and to use drugs. The medical segment of the board shall provide refresher courses in the fields of medicine and surgery as an

aid to the osteopaths now practicing in Kansas who may wish to take the board examination.

SECTION 74 states that an accredited school of medicine shall have a standard not below that of the University of Kansas School of Medicine. Section 75 states that an accredited school of osteopathy shall have a standard not below that of the Kirksville College of Osteopathy and Surgery. Section 76 states that an accredited school of chiropractic shall have a standard not below that of the National College of Chiropractic of Chicago. All three sections then state that all such schools shall be approved by the board.

SECTION 81. All licenses duly issued prior to the taking effect of this act shall be and continue in full force and effect and be renewed under the provisions hereof.

SECTION 84. All examinations for licensure shall be given only by such members of the board who hold a license in that branch of the healing arts for which the applicant seeks a license, provided that an osteopathic physician seeking a license to practice medicine and surgery shall be examined by those members of the board who hold licenses to so practice.

SECTION 85. No person licensed hereunder shall use a title in connection with his name which in any way represents him as engaged in the practice of any branch of the healing arts for which he holds no license: *Provided, however,* That every such licensee when using the letters or term "Dr." or "Doctor" shall use the appropriate words or letters to identify himself with the particular branch of the healing arts in which he holds a license.

SECTION 92. This act shall take effect and be in force from and after July 1, 1957, and its publication in the statute book.

Stormont Medical Library

Loans from the Stormont Medical Library will be sent anywhere in the state. Is that knowledge surprising? Since several physicians have confessed little knowledge about the history and services of this state library, a few pertinent facts are reviewed here. They will be helpful to any physician who wants a bibliography or who needs to refer to the literature for aid in preparing a paper, a case report, a speech.

Requests for material may be mailed to Stormont Medical Library, State House, Topeka, or may be telephoned to Topeka 5-0011, extension 297. Borrowers pay only the cost of postage, and library mailing rates are low, four cents for the first pound and one cent for each additional pound. The usual lending period is for one month.

New medical books are being added continually.

More than 100 medical journals are received by subscription, and an additional 80 are received through gifts, some from the JOURNAL OF THE KANSAS MEDICAL SOCIETY through its exchange agreements with other publications. Patrons are invited to suggest purchases.

The library was established through a gift from Mrs. Jane C. Stormont as a memorial to her husband, Dr. David M. Stormont, who had been devoted to development of medical service and health protection in Kansas throughout his professional life. A small income from the original endowment is still being received, although appropriations from the state legislature provide for the purchase of most books, periodicals, and equipment, and the salary of a full time librarian.

Kansas physicians are urged to use the lending service at any time and to visit the library in its state house quarters. It can serve and expand only through use.

Healing Arts Board

The appointment of five members of the Kansas Medical Society to the newly organized Healing Arts Board, as provided by the 1957 legislature, was announced on July 1 by Governor George Docking: Dr. William P. Callahan, Wichita, for four years; Dr. Billens C. Gradinger, Halstead, for four years; Dr. Francis J. Nash, Kansas City, for three years; Dr. Robert Moore, Lansing, for three years; Dr. Louis L. Bresette, Kansas City, for two years.

At the same time the following osteopaths were named to serve on the board: Dr. J. B. Donley, Kingman, for four years; Dr. Richard Gibson, Winfield, for three years, and Dr. Stanley Davis, Columbus, for two years.

The three chiropractic members of the board were not appointed at that time because of legal difficulties but were later announced to be Dr. Joseph Samskay, Kansas City; Dr. L. C. Neff, Topeka, and Dr. C. L. Blattner, Clay Center.

Basic Science Board

The names of five Kansans who will serve as examiners in the basic sciences, under provisions of a law passed by the 1957 legislature, were announced recently by Governor George Docking as follows: pathology, Dr. Robert E. Stowell, University of Kansas Medical Center, Kansas City, for a four-year term; physiology, Dr. Edwin Martin, Kansas State Teachers College, Hays, four years; chemistry, Dr. L. C. Heckert, Kansas State Teachers College, Pitts-

burg, three years; anatomy, Dr. E. J. Wimmer, Kansas State College, Manhattan, two years; bacteriology, Dr. Merle E. Brooks, Kansas State Teachers College, Emporia, one year.

Changes in A.M.A. Staff

Two changes in the American Medical Association administrative staff were announced recently. Dr. George F. Lull, who has been secretary-general manager of the association for 11 years, has been elevated to the newly-created position of assistant to the president. He will continue serving as secretary, an elective office.

Dr. F. J. L. Blasingame of Wharton, Texas, will take over the position of general manager on January 1. He has been a member of the A.M.A. Board of Trustees since 1949, was president of the Texas State Medical Association in 1955, and is now serving as president of Blue Cross-Blue Shield Plans of Texas. He has been practicing in Wharton for 20 years.

Hurricane Relief Fund

Voluntary contributions are now being received to aid three physicians who lost their offices, clinics, and homes in the Louisiana hurricane late in June. Funds may be sent to Cameron Parish Medical Rehabilitation Fund, c/o Louisiana State Medical Society, Room 105, 1430 Tulane Avenue, New Orleans 12, Louisiana.

All three of the physicians are under 37 years of age, and all are determined to return to their rural practices in the devastated area. One of the three, Dr. C. W. Clark, lost three of his five children in the hurricane.

Hugo Zee, a senior student at the University of Kansas School of Medicine, is one of 34 undergraduate students selected by the American Psychiatric Association to receive fellowships in psychiatry awarded by the Smith, Kline and French Foundation. He is working this summer in the in-patient department at the University of Kansas Medical Center.

The manufacture of pharmaceuticals is among the nation's fastest-growing industries. Parke, Davis and Company report there are approximately 1,200 manufacturers and distributors serving nearly 200,000 physicians and 53,000 pharmacies.

BLUE SHIELD

Kansas Blue Cross-Blue Shield and Cooperatives

Occasionally you may have heard or have been asked this question. Are Blue Cross-Blue Shield cooperatives? The answer is no. However, to fully appreciate the differences between these plans and cooperatives requires an understanding of the unique role Blue Cross-Blue Shield has in our American economy. It is necessary to know what these organizations are trying to do.

The basic problem these plans are trying to solve is one of providing a way for all segments of the community to finance their health care. Included in all segments are low income groups, the aged, the chronically ill and disabled, as well as the average or good risk group of people. This problem is complicated somewhat by the fact that there is an increasing demand by the public for better hospital and medical services in a rising economy. The basic premise of Blue Cross-Blue Shield is that this problem can be solved *voluntarily* without government control or intervention and at the *local level*. This is consistent with the American way of meeting public needs. Blue Cross-Blue Shield believes that this is not only an economic problem but a social problem as well, one in which the whole community must assume some responsibility.

There are some similarities between Blue Cross-Blue Shield and cooperatives. All insurance is a cooperative enterprise in some respects; members pool resources and share risks equally. Many American business enterprises also employ certain cooperative arrangements to meet certain needs. The American railroad industry, for example, found the need to pool its resources and equipment and eliminate competition in order to handle their express services. As a result, the American Railway Express Company was created. Banks join cooperatively to support, for their own use, the facilities and services of a clearing house. American newspapers have pooled their reporting resources and facilities and established a cooperative enterprise known as the Associated Press.

However, this is really beside the point. Blue Cross-Blue Shield are different from cooperatives in purpose, scope of services, legal status, and methods of operation. Blue Cross-Blue Shield are designed to help all Kansans finance their health care. Services are not limited to any particular occupational group or business or trade association. Legally, there are several important differences. Blue Cross-Blue Shield

come under the insurance laws of Kansas and came into existence as a result of special enabling acts passed by the state legislature. They are under the supervision of the state commissioner of insurance. Cooperatives are dependent on the corporation laws of the state for their existence.

Blue Cross-Blue Shield have no profits to distribute to their members because they are non-profit organizations. While there are many different kinds of cooperatives, most divide their profits among their members in proportion to their patronage of the cooperative services or goods. Blue Cross-Blue Shield are limited by statute as to the amount of money they can spend for the administration of the plans. This is not true of most businesses. Not more than 15 per cent of the plans' income can be used for administrative purposes, and not more than 10 per cent can be used for enrollment. Actually, Kansas Blue Cross-Blue Shield have been using approximately 10 per cent of income for administration and enrollment. In addition to this 10 per cent which the plans needs to operate, a small per cent (one to five per cent) is held out for reserve.

This reserve fund differs from a surplus. It is not a fund from which stockholders or owners receive dividends, because there are no owners as such in Blue Cross-Blue Shield. The purpose of the reserve fund is to pay claims during periods of unusually high demand and to help operate the plans when current income is less than expenses. This reserve fund allows Blue Cross-Blue Shield to make an orderly adjustment of dues and experiment with new types of coverage without jeopardizing the rate structure.

Blue Cross and Blue Shield are managed by boards of directors, composed of members, public at large, doctors and hospital people, who serve without pay. There is a salaried staff, headed by an executive director, who carries out the directives of the boards.

In most respects, Blue Cross-Blue Shield resembles a commercial enterprise in its methods of operation. Paying out over \$1,000,000 a month in claims requires the most efficient methods of administration. Blue Cross-Blue Shield employs modern business techniques and accounting systems. Flow charts, quality control systems, and the most advanced automatic equipment are all a standard part of its operation. In addition to this, Blue Cross-Blue Shield is assisted in its claims handling by the doctors and hospitals who actually make out claims for members at the time of service. This enables Blue Cross-Blue Shield to handle claims faster and with a minimum of error.

The close relationship between Blue Cross-Blue Shield and the community hospital and doctor gives

these plans the advantage of being more sensitive to the real health needs of the community. It also permits them to develop flexible programs which can be adjusted quickly to changes of the economy.

In some respects, Blue Cross and Blue Shield resemble cooperatives, and in other respects they resemble regular American enterprises. But, Blue Cross-Blue Shield is essentially a unique and special kind of enterprise that was developed to meet a special kind of need. The plans are not cooperatives and they are not commercial enterprises. They are community service organizations whose sole purpose is to serve the interests of the public, doctors, and hospitals.

Auxiliary Wins Prize

The Woman's Auxiliary to the Kansas Medical Society placed first among states of its size in a contest closed recently by the Auxiliary to the American Medical Association for the sale of subscriptions to *Today's Health*. Three Kansas county organizations also won prizes.

The state group was awarded a cash prize of \$40. Mrs. Francis Basham, Eureka, served as chairman of the *Today's Health* contest for Kansas.

The Auxiliary in Sedgwick County placed first in competition among organizations of its size. Mrs. Paul A. Lovett was chairman. Second prizes in their size groups were won by the Greenwood-Woodson counties organization, Mrs. Robert Obourn, chairman, and by the Labette County Auxiliary, Mrs. A. L. Berggren, chairman.

Fellowship for Orthopedic Surgeon

Dr. Charles E. Workman, who completed his fourth year in an orthopedic residency at the University of Kansas School of Medicine last month, was recently awarded a fellowship of \$7,330 by the National Foundation for Infantile Paralysis. The money is to be used to assist in an additional year's preparation for teaching and research in orthopedics. Next year Dr. Workman plans to serve as a clinical instructor of orthopedic surgery at the Kansas school.

The study financed by the grant includes work on hand surgery at Northwestern University in Chicago under Dr. Michael L. Mason, techniques in equalizing leg lengths at Marquette University under Dr. Walter P. Blount, and the treatment of scoliosis at the Clinic of Orthopedic Surgery in Pasadena under Dr. Joseph C. Risser.

Clinical Session in Kansas City

The annual conference of the Kansas City Southwest Clinical Society will be held this year from September 30 through October 3, at the Municipal Auditorium in Kansas City, Missouri. A list of the speakers to take part and announcement of features of the conference may be found in an advertisement on Page 569 of this issue. Physicians who are members of medical societies in the counties in which they reside are invited to attend.

One of the highlights of the program is a symposium, "The Medical Effects of Radiation," to be moderated by Dr. Eugene P. Cronkite, pathologist-hematologist of Upton, New York. When testifying before a Senate-House subcommittee on atomic energy Dr. Cronkite stated his belief that nuclear war would have "unthinkable" results on all living things.

The complete program of the conference will be published in the September issue of the *Kansas City Medical Journal*, to be distributed the first week in September. Copies may be secured from 3036 Gillham Road, Kansas City, Missouri.

A.M.A. Studies Chemical Laws

A hodge-podge of state and federal laws regulating the labeling of hazardous chemicals and the need for a uniform chemical law recently were revealed by an American Medical Association study. Sponsored jointly by the A.M.A.'s Committee on Toxicology and Law Department, the study was made in preparation for drafting a model chemical labeling law. A conference of interested representatives of government, industry, and medicine will be called this fall to draft a model law which then can be submitted to legislative bodies.

The proposed legislation is intended to reduce careless and ignorant handling of potentially harmful products in and around the home, small businesses, and other areas where control of over-exposure to chemicals is not as efficient as in the manufacturing process. This law will require informative labeling, including listing of possibly harmful ingredients, their potentialities for danger, directions for safe use, and first-aid instructions.

Health is expensive, but disease is even more so. Those who have funds to invest in the welfare of the country of tomorrow could do no better than investing them in the welfare of the students of today. —Dale L. Farnsworth, M.D., *Bulletin, N.T.A.*, May, 1956.

Tumor Conference

Carcinoma of the Bladder

Edited by Robert Qualheim, M.D.

Dr. Stowell: Tumors of the urinary bladder may have a variable growth behavior including a tendency for multicentric origin and recurrence over a prolonged period of time.

Mr. Arnold (Medical Student): M. B., a 74-year-old white man, was first seen at the University of Kansas Medical Center on October 12, 1956, with a chief complaint of "prostate trouble" of one year's duration.

The illness began one year before when the patient first noted frequency of urination associated with mild dysuria. These symptoms were persistent and became progressively more frequent during the preceding year, and during the preceding month he had had to urinate every 30 minutes. Eight months before he first noted terminal hematuria, and this had occurred three or four times during the preceding month. However, he had not observed the passage of blood clots.

In 1952 he had a diagnosis of a right renal stone, but no recurrence of symptoms had occurred.

Physical examination on admission revealed a well developed but thin elderly man. The positive physical findings were hyperresonance to percussion of the chest, firm bilateral inguinal lymph nodes, and a loss of vibratory sensation in both lower legs. On rectal examination the prostate was somewhat enlarged.

Laboratory examination on admission produced the following results. Specific gravity of the urine was 1.010 with a trace of albumin and an acid reaction. The sediment exhibited many red cells and 14-6 white blood cells per high power field. The red blood count was 4.23 million, and a complete hematologic work-up revealed no evidence of pernicious anemia. Cystometric examination revealed an uninhibited neurogenic bladder.

Dr. Stowell: Dr. Todd, would you discuss the roentgenologic findings, please?

Dr. Todd: By intravenous pyelograms the left kidney shows a normal architecture, but at no time is contrast medium visualized on the right. There

is a suggestion of an irregular filling defect at the base of the bladder on the left side, but no obstruction to the ureter is present. However, there is something producing obstruction on the right, and it may be an invading tumor involving the whole bladder, as the urinary bladder is of smaller diameter than usual.

Generally, the radiologist leaves the localization of hematuria from the bladder to the cystoscopist, because he makes a more accurate and logical approach to the problem.

Dr. Helwig: Microscopically the biopsy from the bladder shows a pattern of fronds covered by transitional epithelial cells. The tumor cells are relatively uniform without appreciable atypicality. The sections do not show the base, so we can't say whether or not it is invasive, but it seems to be chiefly superficial overgrowth.

Because of the unpredictability of the future clinical behavior of these so-called benign papillomas, I have long since stopped diagnosing them as benign, and call all of them carcinoma, grade I. Approximately 17-25 per cent of those diagnosed as benign will be followed by carcinoma within a period of five years.¹ It is true that about 75 per cent will be cured, usually by simple fulguration and removal, but the other 25 per cent that recur reveal nothing in their original microscopic pattern that gives one any idea what the subsequent course will be.

Regarding the problem of bladder tumors in general, the pathologist lays great stress not only on the grade of the tumor, but of even more importance, the presence or absence of muscle invasion. It has been shown² that the theoretical cure rate of neoplasms of various depths of penetration ranges from 100 per cent of the lesions confined to the mucosa to 86 per cent of those penetrating less than one half of the muscle thickness and then drops to 26 per cent of these that have reached the extravesical tissue. The clinical results, however, are not nearly so encouraging as the above figures would indicate, but they do confirm that once the neoplasm has penetrated past the mid-portion of the muscular layer, the chance of cure drops to a very low percentage.³

Dr. Valk: This man's first symptom was vesical irritability manifested by frequency and dysuria, and four months later he noted gross hematuria. Most commonly this sequence is reversed. In a large series

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and from the Kansas Division of the American Cancer Society. Dr. Qualheim, a Clinical Fellow of the American Cancer Society, died February 7, 1957.

of cases⁴ hematuria was the presenting complaint in 68 per cent and vesical irritability in 28 per cent.

Our first diagnostic step was to do an intravenous pyelogram so that we could rather quickly survey the genitourinary tract to see if we could localize the source of his bleeding. The intravenous pyelogram showed a non-functioning kidney on the right side which could well have been the source of his trouble. He was examined by cystoscope the next day, and the biopsy was obtained. The tumor appeared to be more invasive than a carcinoma grade I, and we feel that although the pathologist gives us the final word as to the malignancy of the lesion, the cystoscopist can also judge the malignancy by the size of the base and the fixation of the tumor to the submucosa and muscularis. By this method one may be able to differentiate between the 25 per cent which look like a papilloma but which actually invade the muscularis.

We were surprised that the pathological report was a grade I transitional cell carcinoma, so we took the patient to surgery and with a resectoscope removed all of the tumor.

The tumor presented at the bladder outlet and just into the trigone. There was a mass of tumor over the right ureteral orifice, and this may mean that there has been invasion into the orifice causing the obstruction and the non-functioning of the right kidney. On the other hand, it may be a mechanical block due to the advance of the tumor at that point.

Dr. Donnell: The tumors at the base represent a small proportion of the bladder neoplasms that are amenable to inferior segmental resection for the following reason. The lymphatic drainage of the bladder is primarily in a circumferential manner. The lymphatics of the bladder, draining downward to the nodes of the trigone and base, drain primarily laterally and posteriorly in a segmental fashion. We feel that if we can remove the inferior portion of the bladder, we have not only removed the tumor but also the distal lymphatic bearing tissue, and, by so doing, have done as good an operation as if we had taken the whole bladder. For a satisfactory operative procedure the tumor must be limited to at least the lower half of the bladder and preferably even less than that, because a margin of normal tissue has to be removed with the tumor.

The papilloma of the bladder is an extremely interesting lesion, and some people feel that it is of viral origin. Certainly those who have been trying to cure these lesions by destroying one here, one there, and then three to six months later find a new group of lesions wonder whether or not it hasn't grown too fast to be merely a manifestation of multicentric origin. Such lesions can be produced by

some of the aniline dye derivatives such as beta naphthylamine and benzidine. Some people believe that the bladder epithelium may react by metaplasia and then neoplasia to a great number of possible noxious agents that a person ingests.

Dr. Stowell: Dr. Valk, do you wish to comment further about the possibility of substances in the urine reacting upon the bladder epithelium?

Dr. Valk: If the urinary stream is diverted by means of ureterostomies or uretero-rectal anastomoses, and then the patient is exposed to these known carcinogenic agents, papillomas will not develop. This implies that something that is eliminated through the urinary system stimulates the bladder epithelium to proliferate.

Dr. Helwig: It has been found⁵ that tryptophane is not metabolized the same way in some patients with papilloma and carcinoma as it is in normal people.

Regarding diversion of the urinary stream, McDonald⁶ recently produced beta-naphthylamine cancer of the bladder in dogs and then diverted the urinary flow. He hoped this would cause regression of the carcinomas, but the tumors continued to grow.

Medical Student: Is there incontinence following segmental resection?

Dr. Valk: Although it is a hazard, incontinence of the bladder is infrequent.

Dr. Stowell: This is an interesting example of a bladder tumor which brings up the problems of causal factors, course, and development of such tumors, and the fact that they frequently tend to recur. It is very difficult for the pathologist, who looks at only a small portion of the tumor, to predict the future biologic behavior of such growths. By close co-operation between the surgeon and the pathologist, the true extent and the proper course of therapy can be more readily ascertained. Unless treated adequately during its early development, such a tumor will eventually cause death of the patient.

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PHYSICIANS' ACTIVITIES

Dr. Arthur L. Duell, who recently completed a three-year residency in internal medicine at Baylor University, Houston, has begun practice in Concordia in association with the **Gelvin-Haughey** clinic.

Plans to practice in Burlington have been announced by **Dr. Ellis Duncan**, former assistant professor of surgery at the University of Louisville School of Medicine. Dr. Duncan, a diplomate of the American Board of Surgery, practiced in Louisville before World War II, then was in the Army until 1945.

Dr. Clarence H. Benage, Pittsburg, will be chairman of a round table session on "Projects for Patient Care, Commissions and Committees" at the annual meeting of the American Hospital Association to be held in Atlantic City on October 3.

Dr. Carl C. Gunter and **Dr. Herman W. Hiesterman**, Quinter, announce that **Dr. Richard L. Penfold** is now associated with them in practice. Dr. Penfold, a 1956 graduate of the University of Kansas School of Medicine, recently completed internship at Kansas City (Missouri) General Hospital.

The American Heart Association and the Kaw Valley Heart Association announce a grant of \$2,450 to **Dr. G. Loren Norris**, of the H. L. Snyder Memorial Research Foundation, Winfield. The amount is to be used on heart research problems.

A talk on mental health was given by **Dr. Ward M. Cole**, Wellington, at a recent meeting of the Wellington Lions Club.

Dr. Arthur M. Dougherty, formerly of Dodge City, has moved to Ukiah, California, and is now engaged in the practice of industrial medicine there. His office in Dodge City has been taken over by **Dr. Eugene M. Schwartz**, who was graduated from the University of Kansas School of Medicine in 1950. Since then he was in private practice for a time,

served in the Army, and completed a residency in ophthalmology at the Indiana University Medical Center, Indianapolis.

Dr. Wayne G. Parker, who was graduated from the University of Kansas School of Medicine in 1956, completed his internship at Methodist Hospital, Indianapolis, last month and is now practicing in Hoxie in association with **Dr. John Neuen-schwander**.

Dr. Frederick F. Lemon, Douglass, closed his office last month and will continue practice on a part-time basis from his home. The 82-year-old physician, in Douglass since 1917, began practice 56 years ago in Missouri, moved to Oklahoma for six years, and had an office in Stafford for a year before going to Douglass.

A 1956 graduate of the University of Kansas School of Medicine, **Dr. Perry U. Hunsley**, returned from Ohio last month, on completion of internship at Akron General Hospital, and began practice in Belleville.

Plans to open an office in Buhler have been announced by **Dr. O. J. Friesen**.

Dr. Wayne L. Fowler, Concordia, recently became a diplomate of the American Board of Internal Medicine.

A feature story in the *Hutchinson News-Herald* on June 12 paid tribute to **Dr. John J. Brownlee**, who has completed 46 years of practice there. Although he has not retired, he is restricting his practice.

Dr. James H. Davis, who has been practicing in Council Grove for two years, has begun a residency in surgery at the George Washington University School of Medicine, Washington, D. C. **Dr. Royal A. Barker**, formerly of Peabody, has moved to Council Grove to take over Dr. Davis' practice, in association with **Dr. Robert W. Blackburn**.

An account of his trip to Russia was given by **Dr. Rene M. Gouldner**, Wichita, when he addressed the Tri-County Medical Society at a meeting held in Harper recently.

DEATH NOTICES

ARTHUR CORNELIUS GULICK, M.D.

Dr. A. C. Gulick, 88, Goodland physician for 57 years, died at Boothroy Memorial Hospital there on July 4. He had begun practice there immediately after his graduation from Jefferson Medical College, Philadelphia, in 1900. Dr. and Mrs. Gulick had been recognized at a community celebration in 1952 and were presented with numerous gifts and honors, among which was the naming of a city park in their memory. Dr. Gulick had served terms on the Goodland board of education, had been coroner and county health officer for varying periods of time, and had been active in Chamber of Commerce and other community work.

CLARENCE HORACE KINNAMAN, M.D.

Another 88-year-old physician, Dr. C. H. Kinnaman of Topeka, died on July 9 after a long illness. An honorary member of the Shawnee County Medical Society, Dr. Kinnaman had been associated with the Kansas State Board of Health for 31 years and at the time of his retirement was serving as state epidemiologist. He was graduated from Keokuk Medical College in 1899 and came to Kansas in 1920 to head the health department in Geary County, the first such office in Kansas, sponsored by the Rockefeller Foundation as a demonstration health unit. During World War I he served in the Army medical corps, both in this country and overseas.

BENJAMIN HARRISON MAYER, M.D.

Dr. B. H. Mayer, 69, who had been ill for several months, died at the Ellsworth Hospital on July 17. He had practiced in Ellsworth since his graduation from Kansas Medical College, Topeka, in 1911, except during World War I when he served in the armed forces. He was an honorary member of the Central Kansas Medical Society. He was the center link in a three-generation medical family and had practiced in Ellsworth with his father, the late Dr. Henry C. Mayer. His son, Dr. B. H. Mayer, Jr., practices in Denver.

Dr. Findley Law, who has been practicing in Bird City, has moved to Ellinwood and is now practicing there.

Dr. James M. Stout, Hutchinson, has been called to active military duty for a period of two years. During his absence **Dr. Marion E. Nunemaker**, Hutchinson, will serve as city health physician.

On completion of internship at Wesley Hospital, Wichita, on July 1, **Dr. Ross L. Jewell**, a graduate of the University of Kansas School of Medicine, went to St. John to begin practice.

Dr. Marvin H. Cheshire, who had been practicing in Hardtner, went to Winston Salem, North Carolina, last month to begin a three-year residency in surgery.

The *Inman Review* has announced that **Dr. Willard E. Kaufman** has opened an office there as an extension of his primary office in Moundridge. Dr. Kaufman was graduated from the University of Kansas School of Medicine in 1953, served an internship at Wesley Hospital, Wichita, and then practiced in the Holy Land under the Mennonite Central Committee for two years. He recently completed a general practice residency in the Sedgwick County Hospital, Wichita.

Dr. Lewis L. Robbins, Topeka, was one of the guest speakers at a recent meeting of the Idaho State Medical Association.

Dr. Charles C. Gilkey, who practiced at the Santa Fe Hospital in Topeka before opening an office at Perry, has accepted appointment as staff physician at the Osawatomie State Hospital.

Dr. Norvan D. Harris, Liberal, participated in a panel discussion on family counseling, with three other speakers, at a recent meeting of the Liberal Rotary Club.

Dr. Varden J. Loganbill began practice in Moundridge recently, having discontinued practice in McPherson. He and **Dr. Willard K. Kaufman** will practice together, in Moundridge and Inman.

Dr. Clifford C. Nesselrode, Kansas City, was honored recently, on completion of 50 years as a staff member at St. Margaret's Hospital. He was guest of honor at a testimonial dinner at the hospital.

After having been on military duty in Atlanta for two years, **Dr. Don D. Dieter** was recently released from the service and has returned to practice in Salina.

Dr. William J. Madden, Goodland, has been appointed coroner of Sherman County to replace the late **Dr. A. C. Gulick**.

The Ball Memorial Clinic, Manhattan, announces that **Dr. Kenneth M. Boese** is now a member of its staff. Dr. Boese was graduated from the University of Kansas School of Medicine in 1956 and served his internship at Wesley Hospital, Wichita.

Dr. Clair C. Conard, who has been practicing in Kansas City, has joined the staff of the Dodge City Medical Center as a specialist in internal medicine.

The Bethel Clinic, Newton, announces that **Dr. Erwin T. Olson** has rejoined its staff after having spent a year at the University of Kansas Medical Center as a resident in pediatrics.

The Andale community, for the first time in 19 years, will have a resident physician with the location there of **Dr. Joseph Stech**, a graduate of Creighton University Medical School, Omaha, who recently completed internship at St. Joseph Hospital, Wichita.

The American Board of Obstetrics and Gynecology announces the certification of **Dr. Larry L. Gossack**, now practicing at Forbes Air Force Base, Topeka.

Dr. Nelson C. Morrow, Parsons, has announced his retirement and plans to move to Claremont, California. He began practice in Altamont more than 50 years ago and moved to Parsons after military duty in World War I.

Dr. Homer L. Hiebert, Topeka, spoke to the Wyandotte County Tuberculosis and Health Association in Kansas City recently on the subject of the x-ray screening program sponsored by the state association.

An office in Kansas City has been opened by **Dr. John E. Ingram**, a graduate of Creighton University School of Medicine who recently completed his internship at St. Margaret's Hospital in Kansas City.

Dr. Richard L. Dreher, Salina, recently became a fellow of the American Academy of Pediatrics.

The Ashley Clinic at Chanute announces that **Dr. A. A. Kihm** is now a member of its staff. He was graduated from the University of Kansas School of Medicine in 1955 and has been practicing in San Luis Obispo, California, since completing his internship.

Dr. Henry H. Loewen, Wichita, who recently took a trip around the world with 16 other physicians to study medical conditions in 15 countries, told of his trip at a recent meeting of the Sedgwick County Medical Assistants Society.

The Achenbach Memorial Hospital in Hardtner announces that **Dr. Kenneth D. Zimmerman**, who recently completed a residency in internal medicine at St. Francis Hospital, Wichita, has joined its staff.

Dr. Philip J. Antrim, who has been spending three days a week in Luray, has announced plans to close his office there to devote full time to his practice in Russell.

A tribute to **Dr. William G. Norman**, Cherryvale, was published in the July 18 issue of the *Cherryvale Republican*. Although he is 85 years of age, Dr. Norman has been caring for patients there in the absence of other physicians.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, addressed the Kansas City (Missouri) Rotary Club recently on the subject of medical education and medical progress.

Lead Poisoning

A Study of Such Toxicity in Children

CHESTER I. BARE, M.D., *Kansas City*

Although the incidence of lead poisoning in children has been reduced in recent years, it is still an important problem which often goes unrecognized and can be accompanied by fatal and irreversible sequelae. It still constitutes one of the major poisoning problems³² in children. In view of the success of present therapy, it seems worthwhile to review the literature on the subject and to stress the importance of having the entity in mind when confronted with the acutely ill, convulsing, or severely anemic patient.

Lead poisoning in children differs considerably from the disease in adults. Central nervous system involvement³⁸ or encephalopathy, rarely seen in adults, is common in children, whereas peripheral neuritis, lead line on gums, and colic are usually absent in children. Lead poisoning in adults is primarily an industrial problem. This paper will deal with lead poisoning in children.

Sources

Sources of lead poisoning in children are numerous. Lead¹⁸ may gain entrance to the body through the respiratory system by inhalation of fumes containing lead sulfide, through the gastrointestinal system by ingestion, or through the skin.

The most common source of lead intoxication in children^{1, 19, 32, 36} is lead-containing paint. Frequently there is a history of the infant peeling off and eating wallpaper^{1, 32} that has been painted over with lead paint or eating chips of plaster with paint on them. Fallen paint flakes also serve as a source of lead.

Today it is almost a universal practice to exclude lead-containing paint from use on children's furniture, toys, and all indoor woodwork. However, there is considerable contact, particularly in many substandard living situations, with hand-me-down repainted toys, reused nursery furniture, and repainted indoor woodwork such as window sills, which still pose a threat.

There is no legal restriction on the amount of lead¹⁹ in paint for outdoor and indoor use. Almost all exterior house paint contains white lead in

amounts up to 70 per cent, but interior wall paint, furniture paint, and enamels are usually free of lead. In many of the pale colored gloss paints and enamels used today,²¹ titanium, antimony, and zinc oxides have superseded white lead. However, some yellow and green varieties still contain 20 per cent lead chromate. Terms such as "chrome-yellow," "chrome-green," or "chrome-orange" often camouflage lead chromate content in paint pigments. Unless the label excludes lead,³⁸ yellow, green, and orange are not recommended by the Public Health Service for refinishing children's rooms.³⁸ Only 19 states have labeling laws requiring that the amount of lead in the paint be specified on the can. Toys painted with coal-tar colors¹⁹ are certified as safe by the Food and Drug Administration.

Other sources of lead are less commonly found in the home today than they were a few years ago. In 1940, after many cases of poisoning in infants were reported from the use of lead nipple shields,¹⁹ a law was passed prohibiting the manufacture of this product. A few cases^{2, 12} have been traced to ingestion of wax crayons and the inhalation of colored chalk dust with lead in the pigment. White blackboard chalk is made of gypsum and contains no lead. Some porcelain and pottery contains minute amounts of lead in the surface glaze,¹⁹ but the only possibility of excessive ingestion of lead would be from using them as a container for lemon juice, vinegar, or other acids for several hours. Today lead toys are seldom found in the house, but they were formerly one of the major sources of lead poisoning or plumbism. Gibb and MacMahon²¹ report that paint and toy soldiers account for more than half of the cases reported in Great Britain during the present century.

References

In some condemned houses¹⁹ in various cities, the water may be dangerous because of lead used in piping. The Public Health Service sets the safe limit of lead in drinking water at five hundredths (0.05) parts per million. The maximum daily ingestion of about five tenths (0.5) mgm. of lead in food and drink is considered safe.

A few years ago in Japan¹ infants nursing at the breast suffered what was thought to be a new kind of meningitis. Investigation disclosed that the mothers were using a lead-containing body powder on

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Bare completed his internship at St. Luke's Hospital, Kansas City, Missouri, last month and has begun a residency in pediatrics at the University of Kansas Medical Center.

their breasts which was inadvertently ingested by the infants during nursing.

The inhalation of lead vapors sufficient to cause intoxication in children has occurred frequently from the burning of discarded wooden lead battery casings for fuel in the home. There was an outbreak^{18, 32} of such intoxication in Baltimore in 1932. Battery cases are impregnated with particles of lead sulfide which are vaporized when the casings are burned. The discarded cases serve as a good source of fuel for heat during times of family economic distress.

Incidence

The true incidence of lead poisoning^{23, 32, 33, 38} cannot be ascertained because lead poisoning is not a reportable disease; consequently, little statistical information has been available on mortality and almost none on morbidity. However, the condition is widespread throughout the United States and Canada, and it is now recognized as one of the major poisoning problems³² in children. Most of the cases are reported from larger cities where children's hospitals or local health authorities are especially interested in the problem. During the period 1931-1940, the city of Baltimore³⁹ accounted for 49 or 24.3 per cent of the 202 deaths reported from throughout the United States. Twenty-one cases of lead poisoning²⁵ in Chicago in 1953 were uncovered, five of which were fatal. Over one-half of these patients were at one hospital. This high incidence in Baltimore and at the one hospital in Chicago indicates a failure to make the diagnosis elsewhere.

At Children's Hospital in Washington, D. C.,³² from 1950 to 1954, 17 patients with plumbism were admitted, with one fatality. Lanza²³ reported in 1935 that in no year since 1920 have there been as many as 150 deaths in registration areas in the United States. A recent trend of a decrease in diagnosis³⁹ has been ascribed to the ban imposed on lead-containing paints for furniture and toys.

Analysis of data³⁸ of 347 cases of lead poisoning in Baltimore between 1931 and 1951 and other reports has brought to light interesting patterns in seasonal incidence of the disease, age and color distribution of the children, and types of houses involved.

Incidence of plumbism varies with age.^{19, 25, 32} The maximum number of cases occur between one and one-half and three and one-half years of age. This corresponds to the age group where objects are put into the mouth almost as a matter of routine. This is an age period when risks of accidental poisoning from a wide variety of substances besides lead are greatest. Of 17 cases reviewed by Ryan²²

at Children's Hospital in Washington, D. C., the youngest child was 16 months and the oldest four years with a mean age of two years. The Baltimore study shows that 60 per cent of cases occurred among children in the second year of life. Only 2.3 per cent of cases were in children above five years of age.

The annual attack rate for the age segment under five years during the 1931-51 period was 7.5 times higher among the Negro population (71 per 100,000) than among the white population (9.5 per 100,000). The racial difference in incidence here is believed to be due to environmental factors, probably resulting chiefly from economic disadvantages. Other investigators^{32, 38} have found no significant racial or sex predominance among the lower economic classes.

It has been pointed out^{13, 25, 29, 38} that there is a seasonal incidence from June to October, with an increased incidence of encephalopathy during the spring and summer months. Of 17 cases reported by Ryan,³² 15 occurred between June and October and all but two gave definite manifestations of encephalopathy—that is marked irritability or generalized convulsions. Rappaport²⁹ relates this to the intake of vitamin D and sunlight and concludes that a vitamin D producing agent, either sunlight or cod liver oil, increases the amount of lead absorbed from the gastrointestinal tract.

In a series of 30 cases of proved lead encephalopathy, 24 patients had an onset of encephalopathic symptoms between the months of May and September, and two additional patients became ill in November and December. None of these 26 patients had received cod liver oil or other vitamin D preparations. The four remaining cases occurred in the fall and winter in patients who had received adequate vitamin D dietary supplement. Blackman¹³ also demonstrated the onset of symptoms of lead encephalitis in 19 out of 22 cases between May and September.

A relationship to ultraviolet light^{14, 19, 32} has been suggested but not established. Porphyrins are present in increased amounts in patients with plumbism and may become powerful proteolytic enzymes after sensitization by ultraviolet light. The photosensitizing action of sunlight²⁹ appears to produce a slight increase in the severity of poisoning in animals excreting porphyrins in increased amounts.

Cases of lead poisoning are almost exclusively limited to blighted areas. In the Baltimore study,³⁸ about 90 per cent of the houses where child lead poisoning occurred were tenant-occupied. Cases were concentrated in areas of known slum status and in areas where houses were old and had many coats of paint.

Physiology

Lead products may be inhaled, swallowed, or absorbed through the skin. In children¹⁹ the most common route of absorption of lead is by the gastrointestinal tract. This is explained by the mannerism known as pica, the indiscriminate oral sampling of non-food substances. Pica²⁵ is the outstanding precursor of lead poisoning in children and, to a certain degree, is a developmental characteristic in those less than two years of age. In some children this behavioral pattern may persist until the sixth or eighth year. Many theories¹⁵ have been formulated as to what factors predispose a child to develop an abnormal degree of pica. Some have held that abnormal pica is characteristic of mentally retarded children, while others believe that nutritional or emotional factors are its cause. During the early months of a child's life, the mother makes up so nearly his total social environment that study of the mother-child relationship may prove to be the key to understanding the psychodynamics contributing to pica.

Pica²⁵ may be specific or general. In a specific pica the child seeks out one special substance, such as plaster, paint, fuel oil, mud, paper, wood, or crayon. In general pica, substances are chewed and eaten without partiality. Most patients in Byers and Lord's report¹⁵ of 20 cases with lead poisoning showed general pica. Efforts to establish primary or secondary nutritional inadequacy as a cause of pica were not successful. The pica and oral play activities exhibited by the children showed a preponderance of biting over sucking. Aggressive biting by 10 of the 15 children who survived suggests an emotional basis for pica. The behavioral and psychological picture that precedes and follows lead poisoning in children has not been as well surveyed as the physiological aspects.

If dust^{2, 19} containing lead is inhaled, the insoluble lead salts are dissolved in the respiratory secretions by the formation of lead protein combinations and are subsequently absorbed into the circulation. It has been demonstrated in experimental animals²⁷ that finer particles of lead are assimilated most rapidly, supposedly by phagocytosis. Volatile lead products, particularly tetraethyl lead, may be absorbed directly through the skin or lungs.

The absorbed lead first enters the portal circulation, but the form and the vehicle in which it is transported have not been definitely established.¹⁹ Whether it is carried in the diphosphate form that is soluble in plasma or in red blood cells, it is, in a large degree, deposited in the liver. Much of this lead is excreted with the bile and never reaches the

systemic circulation. The remainder, regardless of the compound which was originally absorbed, enters the systemic circulation and is deposited either in the bones as an insoluble tertiary phosphate along with calcium or throughout the viscera in the soft tissues. Liver, muscle, kidney, pancreas, and spleen are the usual sites of early deposition, an exception being tetraethyl lead, which is readily soluble in fats, and concentrates² in the central and peripheral nervous systems. After a few days, however, most of the lead^{4, 19} gradually collects in the growing ends of the long bones and in the margins of flat bones. These deposits are not generated rapidly enough during early phases of lead poisoning to show up as the typical lead line seen on x-ray.

Data⁴ indicate that a small lead excretion in urine occurs daily in the vast majority of people with no unusual exposure to lead, presumably from food products. The normal urine level³² is considered to be 0.02 to 0.08 mgm. per liter, and the normal blood level is 0.04 to 0.06 mgm. per cent.

There is a parallelism between the behavior of calcium and that of lead.^{4, 27} Factors which favor deposition of calcium also favor deposition of lead, and the same applies to mobilization. Stored lead in bones produces no deleterious effects except that it may cause caries in teeth, but it may be released during subsequent illnesses and then cause symptoms of lead poisoning. Aub⁴ developed the original contention that when calcium is being deposited in bones, circulating lead is also deposited in bones; and, when calcium is being pulled from bones, some stored lead is also being liberated. Sobel and Burger³⁴ found that when lead was fed to rats, the lead in the blood came from the diet; but, when feeding of lead was stopped, the lead in the blood came from the bones. When lead was being fed, the addition of vitamin D to the diet increased the rate at which lead was deposited in bones, and when no lead was being fed, a high-calcium, low phosphorus diet caused the most rapid loss of lead from the bone.

Bone trabeculae, particularly at the epiphysis, act to readily supply calcium for the body needs. The trabecular structure is depleted when calcium is demanded by the body and refilled when calcium is stored. Lead is stored in trabeculae in relatively high concentration. Probably not all of the calcium and lead that is liberated from bone is excreted. X-ray evidence indicates that it may circulate and be redeposited in bone, especially in childhood, for roentgenograms show that lead gets repeatedly dissolved and redeposited along epiphyseal lines of growth.

The circulating blood level,^{19, 32} the rate of deposition of lead into the tissues and bones of the body, and its ultimate excretion are altered by conditions such as diet,³ infection, and acidosis. If the diet contains an adequate amount of milk, lead will tend to be deposited more rapidly in the ends of the long bones. If the diet is deficient in milk, or if there is an intercurrent infection with acidosis, lead is more rapidly withdrawn from bones and tissues into the circulation. Once the source of lead is removed, lead in bones and tissues is gradually excreted from the body by normal physiological processes. The amount of lead in the urine roughly parallels the amount of lead in the blood and thus serves as an indication of the rate of transport of lead.

Symptoms, Diagnosis, and Pathogenesis

Lead poisoning^{18, 23} is prevalent though many cases are mild. Both mild and severe cases are commonly not recognized. The occurrence of symptoms depends upon the amount of lead in the soft tissues. The human body²⁷ can accommodate large quantities of lead, when gradually absorbed, without producing symptoms, and it is clinically important only as it may be a forerunner of lead poisoning. When absorbed lead causes symptoms it is assumed that organ damage has occurred.

Lead poisoning may be either acute or chronic. Acute lead poisoning in children^{18, 19} is rare. When it does occur, it is caused by a sudden, overwhelming exposure to lead such as in the inhalation of fumes from the burning of storage battery casings or the accidental ingestion of lead salts. The onset of symptoms is abrupt, with nausea, vomiting, and abdominal pain. This may be rapidly followed by muscular weakness, pain, or paralysis. Hemolytic crisis¹⁷ may occur, and death is not uncommon within a few days.

Chronic lead poisoning¹⁹ is more common in children because they are more inclined to ingest small amounts of lead over a long period of time. Symptoms do not depend on the amount of lead absorbed at one time, but upon the amount absorbed over a given period of time and its subsequent release from soft tissues or bones. Therefore, symptoms are commonly intermittent, with exacerbations being stimulated by such factors as infections or metabolic disorders, which mobilize lead that had previously been deposited in bones and tissues. The history is frequently that of periods of well-being interrupted by periods suggestive of poisoning.

The onset of symptoms^{18, 19, 32, 36} is frequently insidious and may be mild in infants. One of the earliest symptoms is a change in disposition. The

child may become restless at night and peevish during waking hours. Constipation, alone, may be present for months, but occasionally diarrhea is a presenting symptom. Gradually increasing anorexia, loss of weight, pallor, irritability, and then abdominal colic and vomiting are frequently presenting symptoms. Abdominal pain is often accompanied by abdominal distention. Aub⁴ has stated that the colic is due to increased tonicity of the smooth muscle of the intestine and that lead works directly on this smooth muscle, possibly in addition to effects on the sympathetic nervous system. A spontaneous disappearance of colic and vomiting may lull the physician into a false sense of security. In lead colic¹⁸ and spastic constipation there is a tendency for involvement of the vascular system of the upper portion of the digestive tract which may lead to gastric ulcer formation.

The most prominent and severe symptoms of chronic lead intoxication in children are those referable to the central nervous system. Evidence of encephalopathy may not appear until the disease has existed for a long time, or it may appear suddenly in association with some secondary disturbance producing a rapid release of large amounts of stored lead. The onset of encephalopathic symptoms is relatively abrupt, with severe and repeated convulsions. The convulsions are usually generalized but may be focal, and sometimes focal attacks occur on both sides of the body in irregular sequence. Sometimes the convulsions are difficult to control, and children often die in a series of violent attacks. In the interval between convulsions, the child may be drowsy or even comatose, but states of excitement and delirium are also seen.

In 22 cases of encephalopathy due to lead, Blackman¹³ reports that the onset of vomiting in ten cases occurred within three weeks prior to the first convulsion. In many cases convulsions were preceded by behavior changes such as nervousness, irritability, listlessness, disobedience, and crying spells. Transient cerebral palsies are not uncommon between convulsive episodes. Involvement^{25, 32} of the central nervous system is manifest not only by irritability and convulsions, but also by disorientation, hemiparesis, general flaccidity, ataxia, retrobulbar neuritis, optic atrophy, hyper-reflexia, gross tremors, and pathological reflexes such as Kernig's and Babinski's. In severe cases¹ there may be separation of the suture lines of the skull and hypertension. The temperature is usually normal but may be slightly elevated.

Polyneuritis, though much less common than encephalopathy, may occur, especially in older children. In contrast²⁹ to wrist drop and foot drop seen in

adults, paralysis is not so selective in children and involves all the muscle groups, flexors and extensors.

The lower extremities²⁶ are usually more severely affected than the upper extremities, and distal muscles are involved more frequently than proximal ones. The gait¹⁸ has been described as characteristic in that it is a waddling type in which the child walks on the outside of his feet, drags his toes, and with each step swings his legs sideways before putting his feet to the ground. Muscle cramps, especially in the legs, are common. Joint pains and soft tissue swelling of the hands, feet, and face often occur. No morphological damage²⁷ in the joints has been found to explain joint pain. Stored lead in the bones does not cause these or other symptoms.

The single factor most important in making the correct diagnosis in lead poisoning is proper history taking. A history¹ of lead ingestion is generally difficult to obtain and often requires direct questioning; even then the parent's replies may be vague and misleading. With a high index of suspicion, vomiting, abdominal pain, and constipation or diarrhea should be sufficient reason to question the mother^{17, 18} for the presence of pica and to look for positive findings.

Diagnosis^{12, 25} of lead poisoning in children can be difficult since the onset may be insidious and early symptoms—restlessness, easy excitability, pallor of skin, anorexia, constipation, headache, colic—may resemble those of many other diseases. Physical examination,³² in general, is not contributory except when manifestations of central nervous system involvement are present. Lead poisoning should always be considered in a differential diagnosis of convulsions.

The abdominal symptoms¹⁹ of lead poisoning have resulted in erroneous diagnoses varying from epidemic vomiting to mesenteric thrombosis. Frequently, patients have had an appendectomy with temporary relief of symptoms. Acute intestinal obstruction, intussusception, and Meckel's diverticulum may mimic lead colic, with constipation, vomiting, blood in the stools, and rhythmical abdominal pain. Other diagnoses^{9, 19, 23} have included perforated peptic ulcer, gallbladder disease, and pancreatitis. Muscle pain has resulted in a primary diagnosis of osteomyelitis and tuberculosis of the hip.

Encephalitic symptoms, common in children with plumbism, often result in the diagnosis of tuberculous meningitis. This is a natural mistake to make according to Ford,²⁰ especially if the tuberculin test is positive in a young child with stupor, rigidity, and increased protein and cells in his spinal fluid. Often cases are misdiagnosed as behavioral problems, expanding cranial lesion, or epilepsy. The

polyneuritis of lead poisoning has been confused with poliomyelitis, Guillain-Barré syndrome and spinal cord lesions. If several cases occur within a short time, an epidemic of viral encephalitis may be suspected.

The best laboratory evidence^{19, 32} of lead poisoning consists in demonstration of excess amounts of lead in the blood and urine. The technique for analysis of lead is difficult and time consuming. The amount of lead in the urine parallels the amount of lead in transit within the body.

The hematopoietic system^{1, 19, 27} is significantly altered by lead exposure. Red blood cells exhibit two changes with sufficient frequency to be useful, though not definitive, diagnostic aids. These are hypochromic anemia and basophilic stippling. The effect of lead¹⁸ on bone marrow may be so irritating as to result in a decreased output of normal blood cells—by release of immature red blood cells and producing a relative increase in the number of mononuclear leukocytes. The total white cell count, however, is usually normal. The basophilic stippling of red blood cells is generally considered as an important sign of lead absorption. This stippling may vary considerably in size from minute stippling to large aggregates of basophilic staining material within the cell. Stippled cells may make up as much as four per cent or more of the red blood cells. Such cells, however, may be found in infectious diseases, blood dyscrasias, advanced malignancies, and poisoning from other causes; but in no other disease are stippled cells so profuse in the absence of other major blood changes.

Usually stippled cells disappear from the blood two to four weeks after cessation of exposure to lead. Stippling has never been fully explained, but it has been considered to be degenerated reticulocytes, juvenile red blood cells, or manifestations of polychromatophilia. In a review³² of 61 cases of lead poisoning in four different series, stippling occurred in from 53 to 81 per cent. Stippling¹ is apparently an index of the stimulation of erythropoietic activity of bone marrow.

Lead causes an increased hemolysis of red blood cells. In 18 cases out of 21 reviewed by Mellins and Jenkins,²⁵ the hemoglobin level was found to be less than 10 grams per 100 cc. of blood. Hemolysis due to increased erythrocyte mechanical fragility has been suggested³⁷ as one of the mechanisms of anemia. Aub and co-workers⁵ found evidence of hemolysis in four patients, as indicated by elevation of the indirect serum bilirubin. Hemolysis in these patients was found not to be due to increased erythrocyte osmotic fragility, for the red blood cells were resistant to hemolysis in low salt concentrations.

Morgan²⁷ states that lead interferes with the synthesis of hemoglobin, lowering the hemoglobin level and causing an organic pigment normally contained in the heme component of hemoglobin to be excreted as coproporphyrin in large amounts in the urine. The urinary porphyrin test is usually an earlier guide to lead damage than is the stipple count.

Less frequent and more controversial are the effects of lead on the vascular tree of adults,²⁷ particularly its association with hypertension. There is no doubt that in adults hypertension occurs frequently in association with lead colic, but this may be purely a reaction to pain. Cerebral manifestations may mimic hypertensive encephalopathy clinically, and the frequent occurrence of hypertension with the presenting picture has been thought to indicate hypertension secondary to lead as the causative factor. However, in studies of patients exposed to lead²⁷ for many years, there is no convincing evidence that hypertension is more frequent than would be expected in an unexposed group.

Just as increased stippling is not specific for lead poisoning, neither is an increase in the urinary porphyrin level.^{18, 27} Some of the causes of porphyria are infectious diseases, liver diseases, blood dyscrasias, deficiency diseases, skin diseases, and drugs; however, an increase of urinary porphyrin²⁷ due to stimuli other than lead poisoning is small. Normal urine, for instance, contains 10 to 30 micrograms of porphyrin per liter; in benzene poisoning this level may be 255, while in lead poisoning it is over 3,500 micrograms per liter. It is not uncommon for the urine to contain increased amounts of albumin, acetone, and granular casts.¹⁸ Occasionally sugar will be present. Glycosuria^{19, 39} is thought to be of renal origin and is not accompanied by hyperglycemia or polyuria.

Damage to the renal tubules^{25, 27} may occur in massive lead poisoning, the changes being similar to those produced by other heavy metals. It is thought that repeated episodes of poisoning over a long period cause nephrosclerosis as a component of generalized vascular damage. Oliguria, hematuria, and albuminuria may be noted coincident with the appearance of symptoms of lead poisoning, and these urinary findings usually clear as the symptoms are relieved. Fatty vacuolation and intranuclear inclusion occur in the cortical tubules.^{36, 39}

X-ray studies^{1, 18} of growing bones in chronic lead poisoning reveal a deposit of tertiary lead phosphates in the ends of the shaft of long bones and along growing margins of flat bones. These are similar roentgenographically to the so-called growth lines

except that lead lines are usually heavier and thicker. Since these lines are not generated rapidly, they are usually of no value in studying the early case. In the chronic form of plumbism they are almost a constant finding except when active rickets is present. Occasionally opaque lead-containing material is visible in the intestinal tract on a flat plate of the abdomen. Roentgenographic changes show a variable degree of persistence. In 26 patients in one series,³⁶ complete disappearance of the lead line at the distal end of the shaft was eventually noted with recurrences six to seven months later in two patients who had reinstituted the paint chewing habit.

During acute infections and metabolic disturbances lead may disappear from the bones¹⁹ and reappear in the circulation. Thus lead poisoning, with all its clinical and laboratory manifestations, may exist in the absence of a lead line in bones. This line²⁶ of increased density, by itself, does not incriminate lead as similar findings are sometimes seen in normal patients as well as in those with healing rickets, other metabolic diseases, and poisoning with other heavy metals such as phosphorus, bismuth, and titanium.

Spinal fluid may be normal, especially in those cases without encephalopathic symptoms; however, it may be under increased pressure, with greatly increased protein, a positive globulin reaction, and changes in the cell count from normal to 100 or more lymphocytes, the average being 30 to 40 cells.

Severe lead poisoning often occurs with the absence of a lead line in the gums of children. Ryan³² states that the lead line occurs in less than two per cent of children with lead poisoning. It is never present in infants^{18, 19} without teeth. When present it is frequently seen on the buccal rather than labial aspects of the gums, and often near the molar, rather than the incisor teeth. Lead²⁷ combines with decomposed food and gum tissue to form a number of minute granules of lead sulfide in the gums. It may exist as a group of discrete brownish dots, rather than as a line. Poor dental hygiene⁸ is necessary for its formation, and even with severe lead poisoning the lead line may be minimal if the gums are scrupulously clean.

In acute lead encephalitis,^{18, 27} the brain is swollen with flattening of the convolutions and may be hyperemic or pale. Vascular lesions including capillary necrosis and thrombi are sometimes seen. Hemorrhage and round cell infiltration within the pia and an increase in neuroglia cells of the cortex may be present. Most of the injury to nervous tissue¹³ seems dependent on an accumulation of exudate, a serous fluid usually without fibrin. Lesions are patchy in distribution and are found throughout the entire central nervous system, being most abundant in the

cerebral hemispheres and cerebellum. In peripheral nerves the axon and whole cell may be destroyed.

The direct effect of lead on the smooth muscle²⁷ of the intestinal tract is thought to explain the constriction of the small intestine and the resultant colicky pain. X-ray studies during colic do show hypermotility and spasm of the small intestine with subsequent atonicity as the pain eases.

Lead palsy or the muscle weakness seen in lead poisoning²⁷ is due to a direct effect of lead on the voluntary muscles. Lead interferes with the resynthesis of phosphocreatine. Because this chemical effect hinders the recovery of muscles following use, the most exercised muscles are involved. In children this is usually dorsal flexion of the foot in contrast to the wrist drop seen in adults. Degeneration of the anterior horn cells^{24,25} has been noted at autopsy, and this may explain the muscle atrophy occasionally seen in lead poisoning.

Sequelae and Prognosis

The sequelae of lead intoxication in children appear to be mainly neurological. Little interference in physical development has been reported. However, residual effects of toxicity on the central nervous system¹⁸ are at times permanent and progressive. Encephalopathy is common in young children, and the prognosis is serious with a mortality of 20 to 30 per cent in some series.¹ Mentality frequently remains impaired with a tendency to mental sluggishness and melancholia if the patient survives.

In one series³² of 59 cases there were 17 deaths or a 29 per cent mortality. In another series¹² of 20 cases admitted with convulsions there were 13 deaths or a 65 per cent mortality. Of 26 children treated by Thurston and associates³⁶ from 1940 through 1949, seven or 27 per cent died. Cotter¹⁶ states that in the United States some thousands of cases of lead encephalopathy occur annually in children up to three years of age and that the mortality in this group, so far as is recorded, exceeds 25 per cent.

Byers and Lord¹⁵ note in a study of 20 children who had lead poisoning in early infancy that, despite normal motor development during infancy, only one child lived up to the promise of his early development. In a few children successive psychological examinations showed significant drops in intelligence quotients. This was thought to be a result of failure of mental development rather than actual mental deterioration. In other children the intelligence quotient remained well within normal limits. Along with a dilatory effect on mental growth, an increased percentage of behavior difficulties was found.

All 20 patients of Byers and Lord regressed emotionally and behaviorally during and immediately

after the severe illness. This, in itself, is not unusual, but the failure to catch-up during the period of convalescence would seem to indicate that lead poisoning caused retardation beyond that which commonly accompanies a serious illness and hospitalization. Approximately six months after recovery from the acute episode, 14 of the 15 surviving children were found to be retarded in some way. Language ability and finer muscle coordination were most disturbed. Extreme distractibility, short attention span, and a high variability on psychological tests were characteristic.

Thurston and co-workers³⁶ found no evidence of mental deterioration in their series of 11 cases. Two of the 11 children later had bilateral optic atrophy, and a third child had a high degree of myopia. They felt these children were at a serious disadvantage because of the mode of instruction in primary grades and should receive special attention to offset visual-motor deficits. No direct correlation between the severity of the illness and the amount of residual effect was noted.

Treatment

The problem of treating lead poisoning is in controlling the deposit and excretion of lead from the skeletal storehouse.⁴ A new compound for treatment of lead poisoning has been available the past four years since development of the neutral disodium calcium salt of ethylene diamine tetraacetic acid (EDTA).

Earlier treatment regimens³² consisted of first inducing the deposition of lead in the bones and tissues by a high calcium diet and adequate vitamin D to reduce toxic blood levels, and then instituting carefully controlled deleading processes once the acute phase had terminated. Previous methods¹¹ of deleading which were most successful were the use of citrate, phosphate and 2, 3, dimercapto-n-propanol (BAL). However, complexes formed by lead with these substances do not remain sufficiently stable to prevent the toxic effect of free lead during excretion via the urinary bladder or gut. The danger of causing encephalopathic symptoms during any deleading process is always present. Sodium citrate forms lead acetate, which is metabolized in the normal oxidative process, thereby freeing lead to form complexes in soft tissue.

BAL competes with the sulfhydryl containing enzymes for heavy metal. It has been demonstrated that lead may completely inactivate the sulfhydryl-containing enzyme, succinoxidase, and that reactivation occurs with the addition of BAL.⁷ The results of experiments with rabbits, however, suggest that the lead-BAL complex is more toxic than lead alone.^{1,33} Clinical results have been controversial. BAL has far

less affinity for lead and causes less enhancement of excretion of lead than CaEDTA.

EDTA belongs to a class of compounds known as chelates, a word derived from the Greek for claw. All chelating agents possess two or more active groups, which are capable of forming bonds with multivalent metals. When chelation involves a multivalent positive ion³¹—for example, calcium—the calcium ion becomes an integral part of the ring structure and in so doing the calcium ion loses its ionic properties. Frequently chelating agents will form a water soluble product with a multivalent positive ion. This is true of CaEDTA,³⁷ which forms a stable, water-soluble, non-ionizable ring complex with a variety of metallic ions.

The special property of EDTA which makes this compound particularly active in bonding to heavy metals is due to two nitrogen atoms in the molecule which forms additional bonds. Thus at physiologic pH, each heavy metal ion is bound to a single molecule of EDTA by four bonds.

Although EDTA can form a complex with almost any metal,^{11,33,37} the strength or stability of the complex with different metals varies, and a metal which forms a stronger complex can replace one which forms a weaker complex. The alkali metals, Na and K, are held most weakly; the alkali earths, Ca and Mg, and the rare earths and di- and trivalent cations, Pb, Cu, and Ni, follow in increasing degree of chelate stability.

EDTA¹¹ forms such a tight complex even with calcium that it can be used as a laboratory anticoagulant. It can combine with serum calcium to the extent of causing hypocalcemic tetany and eventual death in hypotension.²⁸ Since this calcium complex is non-toxic on slow intravenous administration,³⁵ and since lead will replace the calcium of the complex, CaEDTA is theoretically the method of choice for administration of EDTA in lead poisoning. It has been shown³⁵ that parenteral CaEDTA causes no appreciable decalcification and that it results in the increased urinary excretion of lead in experimentally poisoned animals.³

As one would expect in view of chelation preference, when unbound EDTA is administered rapidly to animals and humans, the serum calcium decreases and tetany may ensue.²⁸ When administered as the preformed calcium chelate (CaEDTA), however, serum calcium levels remain unchanged.³⁷ The calcium ion of CaEDTA is readily replaced by cobalt, zinc, lead, copper, and nickel because of the greater stability constants of these heavy metal chelates. The copper and nickel ions are only slightly stronger than lead in their degree of chelating stability.

Once lead is bound to EDTA,¹¹ it has a different

distribution than the free metal, for it passes freely through most of the body membranes and is excreted rapidly by the kidney. Ninety-five³³ to 98 per cent of C¹⁴ labeled CaEDTA, administered parenterally to rats, was recovered in the urine within six hours. The urine output³⁰ was found to be increased in all patients while the drug was being administered. This increase in urine volume was greater than could be accounted for by the volume of the five per cent glucose solution in which the drug was administered, or by an increase in oral fluid intake.

Two mechanisms may be operating in effecting some measure of diuresis. It has been found in studies conducted *in vitro*³⁰ that CaEDTA removes lead from kidney slices more rapidly than from slices of other tissues. The kidney may, therefore, be one of the first organs whose lead load is lightened sufficiently to show considerable improvement in function. This observation is borne out by the fact that five of nine patients showed some objective signs of impaired kidney function before therapy, and these signs were absent following treatment. However, all these patients showed a 10- to 40-fold increase in urinary excretion of zinc.³⁰ This observation raises the possibility that the drug takes zinc away from carbonic anhydrase, thereby inhibiting this enzyme and causing diuresis.

The lead complex¹¹ itself is relatively non-toxic, and no symptoms of lead poisoning are shown by animals receiving amounts of lead-EDTA, which as a free metal would cause fatal intoxication. The same phenomenon appears in patients with lead encephalopathy who receive CaEDTA. Calcium is exchanged for lead, and the blood level of lead rises to heights never before found in surviving patients; yet even at the height of the blood lead level, the patient is improving.

It has been demonstrated³³ that CaEDTA does not enter the red cells, is not metabolized, does not concentrate in any organ or tissue, is excreted by the kidney in a manner similar to Diodrast, and rapidly leaves the vascular system to mix with approximately 90 per cent of the body water. Metabolic inertness and rapid and complete excretion account in part for the low toxicity in animals and the absence of toxicity in humans when recommended dosages are used.

In children,³³ the blood lead level rises noticeably during therapy without exacerbation of symptoms. Adults receiving intravenous treatment consistently show a fall in blood lead values during treatment, but with a rebound in the first weeks following treatment. The value subsequently falls. This rebound phenomenon has not been associated with a recurrence of symptoms. Rebound is not seen in patients

during the course of therapy. This difference of response of blood lead concentration in children and adults may be due to the more rapid metabolic turnover in children, hence the stored lead is mobilized with greater facility. In adults the lead is apparently chelated and the complex excreted more rapidly than lead is mobilized, resulting in a fall of blood lead concentration during therapy.

CaEDTA removes lead *in vivo* only from soft tissue,³⁰ and following deleading of soft tissue normal metabolic turnover of bone tissue results in a renewed build up of lead levels in soft tissues. This constitutes a potential source of lead poisoning for some time following a course of therapy with CaEDTA. Some time after an infusion of the drug, if it is again given, the lead which will have accumulated in soft tissues can again be removed with considerable efficiency.

No toxic effects^{17,37} from CaEDTA have been reported. However, it has not been conclusively demonstrated that EDTA will not inactivate trace metal containing enzyme systems necessary to normal metabolism. Only about one per cent of the CaEDTA^{16,22} administered is recovered as lead-EDTA, which further suggests a possible formation with trace metal complexes.

The rapid and marked decrease of urinary coproporphyrin excretion³⁰ indicates that toxic effects of lead on erythrocytic cells are arrested almost as soon as therapy with CaEDTA is initiated.

In treatment of lead poisoning Belknap and Perry¹⁰ have found, regardless of the amount of lead in the system, that excretion of lead reaches a peak in 24 to 48 hours after treatment with CaEDTA is started. For this reason they advise giving the compound for two days and omitting it for five days and repeating this cycle until the pathological deposits have been removed.

The drug may be administered intravenously, subcutaneously, or orally. Parenterally³³ the drug is usually diluted in order to avoid any possibility of phlebitis. Intramuscular injections, even when one per cent procaine is added, have been painful to some patients; hence they are not used.

The problem of an optimal dose is a difficult one and has not been fully agreed upon. For oral dosage, Sidbury³³ recommends 30 mgm. per kgm. of body weight for both children and adults given before breakfast and supper with liberal amounts of water. A larger oral dose resulted in diarrhea and abdominal pain.

Sidbury³³ recommends as an intravenous dosage for adults one gram on the first day and two grams a day thereafter for a total of five days. He gave the drug in divided doses twice daily in 250 cc. of five

per cent glucose in water by slow infusion. No significant toxic effects were encountered from this dosage in over 35 patients—even though about 30 per cent had evidence of renal pathology.

Bessman and associates¹¹ found that doubling the amount of CaEDTA caused about the same excretion as an initial dose of 0.5 grams. This suggests that either the available lead had been used up or that in doses greater than 0.5 grams the CaEDTA is excreted too rapidly to permit it to come into equilibrium with body fluids. Bessman and associates¹¹ used 0.5 grams of CaEDTA subcutaneously or intravenously every eight hours for five days, followed by a three-day rest period with repetition of a five-day course. In treatment of seven cases of lead encephalopathy they noted no signs of toxicity from CaEDTA. The final dosage and schedule of administration of this drug await further experience by these workers.

With a rest period¹⁸ interposed between therapy there is a lessened likelihood of depleting essential trace metals by chelating with EDTA and excretion along with lead.

In addition³² to this specific method of treatment there remain the usual supportive measures. Sedation, analeptic medication, blood transfusions, and even cranial decompression are frequently indicated. Convulsions can be managed by 0.2 to 0.4 cc. per kilogram of body weight of a 25 per cent solution of magnesium sulfate given intramuscularly every six hours. A rapid subsidence of lead colic occurs with slow intravenous injection of 10 cc. of a 20 per cent solution of calcium gluconate.

CaEDTA has received much acclaim as the answer to the treatment of lead poisoning. However, it has been used for a relatively short period of time, and then only in limited dosage for treatment of clinical symptoms. That it can be used as an industrial prophylactic drug seems improbable in view of evidence that chelation of trace minerals may interfere with enzyme systems of the body. Only careful and thorough investigation of this and other problems that arise can determine whether certain beneficial effects will outweigh detrimental actions which may arise from its use.

Summary

1. Although lead poisoning is much less frequent than many other diseases in children, it is still prevalent, especially among children living in a poor economic environment.

2. Chewing on furniture, toys, or woodwork painted with lead-containing paint is the most common source of this poison.

3. A parallelism between the physiologic behavior of calcium and lead exists in the body. Some of the

ingested lead reaches the circulation and is then carried to many parts of the body, where deposition in soft tissues causes symptoms.

4. The symptoms are often insidious in onset. The diagnosis is dependent upon a history of pica, suggestive symptoms, the results of quantitative blood and urine studies, and x-ray examination of the long bones.

5. The prognosis is serious, since there is a mortality of 20 to 30 per cent in some series of cases. Sequelae frequently consist of blindness and permanent brain damage.

6. Treatment consists of specific and supportive measures. Acute cases of chronic lead poisoning have been treated with CaEDTA, which leads the body without development of the toxic symptoms inherent in the process. Other possible toxic manifestations of this drug need further investigation before final evaluation is made.

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Film Describes Role of Radiologist

A new color motion picture dedicated to the radiologist has been added to A.M.A.'s film library. "First a Physician" tells the dramatic story of what a radiologist is, what he does and how he serves patients. The film was produced by E. I. du Pont de Nemours and Co., Inc. in cooperation with the American College of Radiology.

Medical societies may arrange for bookings through the film library. The film will be particularly suitable for school, club, and other public gatherings.

BOOK REVIEWS

Hutchinson's Clinical Methods. Thirteenth Edition. By Donald Hunter, M.D., and R. R. Bomford, M.D. Published by J. B. Lippincott Company, Philadelphia. 452 pages. Price \$6.00.

The English seem to have a faculty for clear and concise exposition, and the current edition of *Hutchinson's Clinical Methods* is a case in point. It is not presented as a comprehensive treatise on diagnosis, but rather as a summary of those methods of clinical investigation necessary to the establishment of a correct diagnosis.

This book is small in size, and it is well organized so as to be a handy and ready reference for students and practitioners. It contains a great deal of material that should be of help in the clinical evaluation of a patient and the establishment of a correct diagnosis.

It is not being unduly critical to point out that coverage is sketchy in places; for example, no cold pressor test is mentioned in the section on hypertension, and no classification of eye grounds in hypertensive or arteriosclerotic disease is included.

The book is well printed on good quality paper, and the binding is quite good. A fair number of good black and white photographs, diagrams, and tables supplement the text and add to its value. As usual, color plates consist of reproductions of colored drawings rather than the more desirable color photographs and photomicrographs.

Medical students should find, in this little volume, an excellent supplement to the standard textbooks on physical diagnosis and clinical pathology; and many practitioners will undoubtedly find it to be a convenient source of reference, and, more important, a good review of things once known but now forgotten.—J.D.R.

Rypins' Medical Licensure Examinations. Eighth Edition. Edited by Walter L. Bierring, M.D. Published by J. B. Lippincott Company, Philadelphia. 964 pages. Price \$10.

Licensing boards perform a function required by the law of the states. Examinations prepared by such boards, made up of men in active practice, serve as a valuable check upon the work of medical schools. By the same token, licensing boards should be clearly aware of the progress being made in medical schools.

Every candidate for a medical license has some apprehension concerning his ability to cope with the point of view that will be taken by the state examiners concerning the answers he may give to their questions.

After a critical survey of many thousands of questions used throughout the United States, the author made a selection of typical questions which served as a basis for a most comprehensive review in major medical subjects.

With the able assistance of eminent authorities in each of the ten subjects reviewed and a study of the National Board of Medical Examiners' objective multiple choice type of examination, Doctor Bierring has re-edited this eighth edition with a view toward giving the candidate for license a comprehensive review and an assurance of a general agreement among examiners regarding essential material.—O.W.D.

Practitioners' Conferences. Held at New York Hospital-Cornell Medical Center. Volume 6. Edited by Claude E. Forkner, M.D. Published by Appleton-Century-Crofts, Inc., New York. 378 pages. Price \$6.75.

The reviewer has become familiar with and used all previous volumes of the *Practitioners' Conferences*, but finds this the most informative of the group.

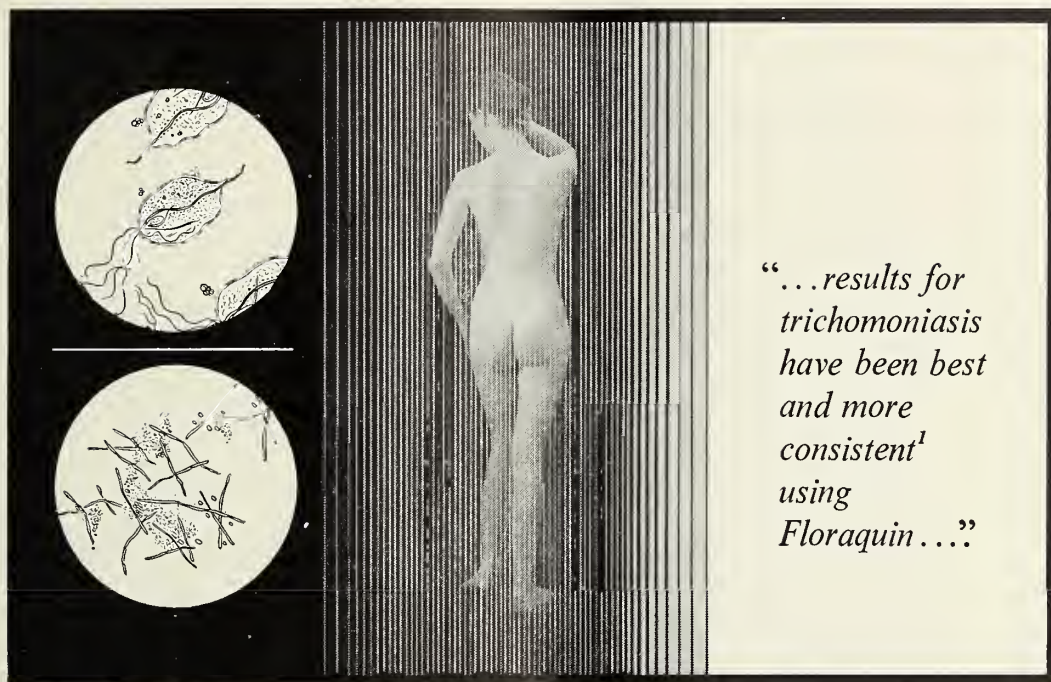
Reproductions of unrehearsed, spontaneous, clinical discussion often are characterized by discontinuity, disagreement, and indecisiveness. Little of such is apparent here; and any similar weakness is more than compensated for by the complete and lucid outlines summarizing each presentation. Dr. Forkner not only guides the discussion well but adds fine editorial workmanship in the summaries. Of unusual appeal to practitioners should be the overall atmosphere of clinical medicine evident in each conference. While basic science workers contribute, the bulk of comments are not only directed at clinicians but made by practicing physicians.

Volume Six treats a total of 15 subjects including: Should Patients Be Told the Truth About Serious Illness; Trichinosis; Cancer of the Thyroid; Portal Hypertension; Early Detection of Heart Disease; Dermaphytosis; Tinea Capitis, and Monilia Infections of the Skin; Endometriosis; Gout; and other equally important areas of almost daily interest to the practicing physician. The conference on trichinosis is alone worth the price of the volume. The same could be said of the discussions of gout and cancer of the thyroid.—M.H.D.

Signs and Symptoms. Third Edition. Edited by Cyril M. MacBryde. Published by J. B. Lippincott Company, Philadelphia. 973 pages. Price \$12.00.

This book is presented as an approach to diagnosis of disease, or, to use the author's phrase "applied

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1. Pitt, M. B.: Leukorrhea. Causes and Management, J. M. A. Alabama 25:182 (Feb.) 1956.

2. Parker, R. T.; Jones, C. P., and Thomas, W. L.: Pruritus Vulvae, North Carolina M. J. 16:570 (Dec.) 1955.

SEARLE

pathologic physiology in clinical interpretation." As such, it deals directly with presenting complaints. It attempts to identify and differentiate possible causes and to explain the underlying mechanisms of commonly occurring symptoms. Some 28 authors have contributed portions of the text, generally treatises on a subject within their special field, and most of them are recognized authorities. The material is presented in 34 chapters, including an introductory analysis of the approach to diagnostic medicine, discussion of growth and sexual development, a series of chapters on pain in various parts of the body, chapters on specific symptoms of the cardiorespiratory system, the gastrointestinal system, hemopoietic and lymph systems, discussion of fever, a section on nervousness and neurologic disturbances, discussions of water, electrolyte, and caloric balance, and finally two chapters on the skin, all based on signs and symptoms.

This volume is not to be considered as a ready reference book or a "do-it-yourself" effort. It contains few, if any, outlines or tables, and it does not provide any mechanical magic with which to reach a diagnosis. The bulk of the material is devoted to the background of manifestations of disease and the physiologic mechanism of various symptoms and signs. It, therefore, provides a frame of reference within which an individual's complaints can be evaluated, and at the same time it attempts to cover, at least by name, all of the possible causes of any given manifestation of disease. It will be found principally useful to the physician who has read it through thoroughly and from it gained added insight and understanding of the complaints he hears each day. Once acquainted with its contents, the physician will note many clues which he might otherwise overlook, and may in addition find the volume helpful in checking on this or that question raised by some particular patient.

With this understanding of the aims of the editor, one can certainly say that this is a commendable effort, and the book is well worth reading by any physician who deals regularly with diagnostic problems. Certainly there is a wealth of material for the medical student or intern to absorb. This is a fascinating field; the more it is considered, the more could be said on the subject. Thus when one is finished reading this book, he has the feeling this is not the last word, even though there is no other volume available approaching the subject in exactly the same way.

It is obvious that the editor has had to make many compromises in balancing the content and emphasis. Some relatively minor subjects receive a considerable amount of space (such as fainting, not including con-

vulsive seizures, with 14 pages, or headaches with 43 pages) while others are skipped through rather superficially (such as the chapter on nervousness and fatigue, which also includes only 14 pages). Obviously, attention must be given to exotic and rare conditions which may present a given sign or symptom, but at the same time a practical diagnostic approach gives first emphasis to common causes. Throughout the volume mention of psychogenic factors is made regularly, and yet in only a few cases is this aspect adequately discussed. Possibly a companion volume devoted principally to this subject, and to the important question "Why does a given patient come to a physician at any given time?" would serve to balance the more technical material.

So far as the details of publication are concerned, they are generally satisfactory. The printing and format are good. There are not many illustrations for a book of this type, yet some are not too important. In particular, of the six color plates, only two seemed really necessary and useful, whereas numerous opportunities for others are overlooked. In a few places, proprietary names of drugs are used in a rather careless fashion. Adequate bibliographical material is presented at the end of each chapter, and there is a useful index.

This is a worthwhile book, and one which has obviously improved and rounded out as it has gone through the editings. Possibly the material could be handled in fewer pages, but it will prove interesting and instructive to the physician who is really interested in the art and science of diagnosis, and as such it can be recommended.—J.E.S.

Gifford's Textbook of Ophthalmology. By Francis Reed Adler, M.D. Published by W. B. Saunders Company, Philadelphia. 499 pages. Price \$8.00.

The original *Textbook of Ophthalmology* by Dr. Gifford is familiar to many of us because it has been the standard book used in many medical schools and also by many general practitioners as a ready reference book.

This edition covers the subject of ophthalmology very well. It has many additions such as the treatment of diseases with the new drugs. The portions dealing with tuberculous and syphilitic diseases have been deemphasized, and rightly so, since they are far less common today.

It is true that there have been volumes written and published on any one of the subjects covered in these chapters; however, many of these conditions are of interest only to the ophthalmologist. The cov-

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erage in this book is adequate for the medical student or the general practitioner.

With advances that have been made in color photography, it would seem to me that more color plates of such things as arteriosclerotic and diabetic retinopathy, conjunctival lesions, and optic nerve disease would be of great value from a teaching standpoint.

I would recommend this volume to any teaching institution or practicing physician for a reference book.—R.R.P.

A Manual of Pharmacology. Eighth Edition. By Torald Sollmann, M.D. Published by W. B. Saunders Company, Philadelphia. 1535 pages. Price \$20.

Probably every practicing physician over the age of 40 cut his pharmacological eyeteeth on Sollmann's *Manual of Pharmacology*, as this book had the field pretty much to itself until about 15 years ago. Everyone realized that, as a textbook, it left a great deal to be desired, but in spite of its rather haphazard organization it was the one book upon which one could depend for needed pharmacological information almost every time. Where else can one find reassurance for the frantic mother whose little darling has just eaten a handful of bittersweet berries?

To quote from the author's preface: "The purpose of this Manual is to furnish a guide through the complexities of modern pharmacology—the actions and uses of drugs. Contributions to this subject are being published at an ever-accelerating rate and the wealth of material is indeed confusing. The Manual aims to summarize critically the chief features of these contributions."

Dr. Sollmann has fulfilled his aim admirably in the past, but it is a disappointment to have to report that the present edition shows signs of haste and careless editing. Even as erudite and accomplished a pharmacologist as the author seems to have been confused by the "ever accelerating rate" of contributions to the pharmacological literature. Therefore, one cannot depend upon the book for authoritative statements about new drugs. This is especially unfortunate as students and physicians have the utmost difficulty in locating precisely this type of information.

As a case in point, "Frenquel" and "Meratran" are discussed as trade names for pipradrol hydrochloride. Actually "Frenquel" is the trade name for azacyclonol, and the two drugs, even though they are isomers, have entirely different pharmacological actions. Furthermore, "Meratran" is misspelled, "Meradran," which cannot fail to add to the confusion. Furthermore, meprobamate ("Miltown; Equ-

nil") is misspelled both in the text and in the index, and the section on this widely used drug is wholly inadequate.

The chapter on adrenal cortical hormones contains a great deal of interesting and important information, but it lacks the organization which could unify and simplify the subject, and it does not contain the graphic formulae which are so important in delineating the structure-action relationships. Incidentally, fludrocortisone is misspelled.

The oral hypoglycemic agents, carbutamide and tolbutamide ("Orinase") are given sketchy treatment at the end of the chapter on sulfonamides. One could also go into the shortcomings of the section dealing with antibiotics, but there is no use laboring the subject.

One of the outstanding features of the book is the detailed bibliography which fairly well covers the pharmacological literatures since January 1, 1940. The book is well printed and well bound. If it were not for the fact that the reader cannot have full confidence in its accuracy where new drugs are concerned, it would be a valuable addition to the physician's library.—J.D.R.

A Visit to the Hospital. By Francine Chase under supervision of Lester L. Coleman, M.D. Illustrated by James Bama. Published by Grosset and Dunlap, Inc., New York. 68 pages. Price \$1.50.

This children's book is an account of a boy, Stevie, who goes to the hospital for a tonsillectomy. It simply but effectively describes the clinical examinations, the anatomy, and the reasons for the operation, the various admitting procedures and environment of the hospital room and surgery. It depicts the various steps of the operation, the anesthesia, the convalescent phase.

The text can be read by a child with third grade reading ability. For younger children, there are effective drawings which parallel the content of the text and can be easily followed as an adult reads the story. Several children were asked to read this book, and all indicated their pleasure with it. One little boy, who had recently had a tonsillectomy, immediately identified with the entire narrative.

This is the type of consideration for a child's feeling and the type of preparation for what, to some children, may be a mysterious ordeal, that is most necessary in our present enlightened medical era. It would be a hope that one of the things the book can accomplish would be to bring to the attention of adults how important it is to prepare and to share with the child such a major life adventure.—H.G.G.



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The Ciba Collection of Medical Illustrations, Volume III. Digestive System, Part III, Liver, Biliary Tract, and Pancreas. By Frank H. Netter, M.D. Commissioned and Published by Ciba Pharmaceutical Products, Inc. Price \$10.50.

In publishing a review of the above named book in its July issue, the JOURNAL inadvertently quoted the price as \$13 instead of the correct figure, \$10.50. The change is noted here so that those who were influenced to purchase the book from the favorable review will know the correct amount.

Surgery: Principles and Practice. Edited by J. Garrott Allen, Henry N. Harkins, Carl A. Moyer, and Jonathan E. Rhoads. Published by J. B. Lippincott Company, Philadelphia. 1,495 pages. Price \$16.

One might well ask why another textbook of surgery should be put on the market when so many satisfactory volumes are already available. This one, however, seems to be on a somewhat different basis—emphasizing “physiological, biochemical, pathologic, and anatomic bases of surgical practice”—and hoping that it would improve the background knowledge of medical students for good surgical practice.

The opening chapter—“Surgical Philosophy”—is thought-provoking reading for anyone, and it and the chapter on “Wound Healing” are worthy of the time of the experienced as well as the student surgeon.

The book emphasizes “the things that most doctors need to know about surgery rather than the more detailed points of technic that the surgeon uses,” yet as an example of principle it contains detailed descriptions of some of the important procedures. Contemporary surgery is featured prominently, and all the surgical specialties (except ophthalmology and otolaryngology) receive recognition in the text.

It is a good text, well written, with good illustrations, and it deserves a place in our surgical libraries, as well as in those of the medical students.—O.R.C.

Surgery in World War II, Orthopedic Surgery, European Theater of Operations. Published by Office of the Surgeon General, Department of the Army, Washington, D. C.

This book is one of the series being published by the Medical Department of the U. S. Army relating experiences in caring for the wounded during World War II. It is a systematic presentation of the various facets of hospital function—administration, training, an explanation of the “consultant system,” facilities

available and how they were used, principles of mass management of casualties, and experiences of representative hospitals in the theater of operations. There is also a detailed (and still concise!) presentation of principles of treatment of specific types of injuries, with the why and wherefore of failure or success. This may sound like dull reading; actually it is nothing of the sort, and for anyone who had a part in its making there is constant anticipation in its reading. One may ask, “Why any interest in such a history of war surgery 11 or 12 years after it is over?” For doubting Thomases good reason is given in the introduction. During World War I a few British and American surgeons had, after the unsatisfactory consequences of primary wound closures, evolved a plan of management including adequate debridement and delayed closure, which achieved satisfactory results “in more than 80 per cent of the wounds in which they were employed.” However, the “American orthopedic experience was relatively brief . . . limited to a relatively small number of highly competent, top-ranking officers . . . not relayed to the outlying and forward hospitals. . . .

“This priceless information was incorporated in both the British and American official histories of the medical experience in World War I. It would have proved extremely valuable had it been put to immediate use in World War II. It was not. Almost no use was made of these techniques in the interim between the wars. They were not utilized when World War II broke out, either in the training of medical officers after it had become evident that United States participation in the war was inevitable, or later, when this country entered the war.

“If the medical histories of World War II incorporate the clinical experiences of that war and if what is printed will be read in the future—as it has not always been read in the past—military surgeons will not, in the future, repeat the mistakes of the past as they did in World War II.”

We don’t want another war experience, but if we must have one we can learn from the vast experiences of World War II, and much of it is also applicable to civilian surgery—particularly the care of mass casualties.

Two additional volumes are planned on orthopedic surgery. It will be an excellent treatise if they follow the standard of this volume.—O.R.C.

Surgery in World War II. General Surgery, Volume II. Edited by Col. John Boyd Coates, Jr., MC; Michael E. DeBakey, M.D.; W. Philip Giddings, M.D., and Elizabeth M. McFetridge, M.A. Pub-

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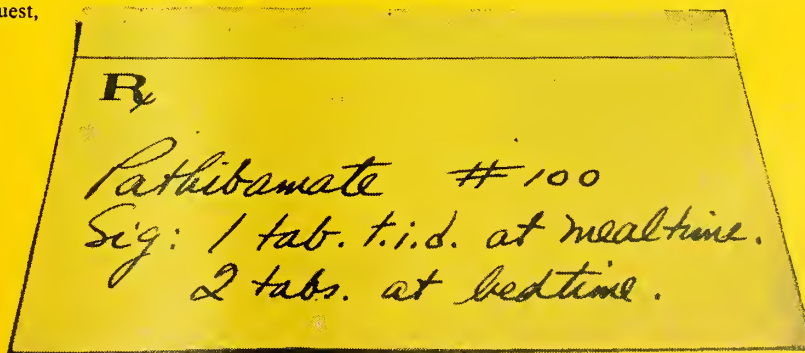
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lished by Office of the Surgeon General, Department of the Army, Washington, D. C. 417 pages. Price \$4.25.

This is another of the series being published by the Medical Department of the U. S. Army. Although called Volume II, this is the first of the series on general surgery.

The principal subject of the volume relates to experiences in care of abdominal injuries encountered by the Second Auxiliary Surgical Group, operating within the Mediterranean theater. The fact that 3,154 abdominal injuries and 839 thoraco-abdominal injuries were encountered is impressive, but the details of information which were preserved, even during periods of the stress of military surgery, make this document more useful than many might expect. The vast experiences justify conclusions, and the conclusions justify careful consideration of other surgeons.

The problems of the severely (or critically) injured are discussed, beginning with the moment of the patient's admission to a forward field hospital. Resuscitation, control of pain, and anesthesia are all important and are given due credit for their share of the successful care of these severely injured soldiers. The main body of the book deals with injuries to each of the organs within the abdomen, and a closing division presents the problem of colostomy as related to abdominal trauma—a vastly different concept from that extant before the related experience.

With the consideration of complications and factors of mortality, and a summary of conclusions drawn from the experiences, there is much to be learned from such a compilation of facts.—O.R.C.

The Physician-Writer's Book—Tricks of the Trade of Medical Writing. By Richard M. Hewitt, M.D. Published by W. B. Saunders Company, Philadelphia. 415 pages, 37 figures. Price \$9.00.

"The aim in preparing the book was to aid the inexperienced, inexpert, occasional physician-author, whose material is written for other physicians. The volume is not a style book."

This is a book about the organization and preparation of medical papers, theses, and books. All phases of the problem are considered, from the original decision of whether one "has anything to say" to the final conclusions and titling of the product.

The author is well qualified by experience and training to write such a book. Much which is in it would be valuable to all who are writing even one

paper, but obviously not all such authors would (or could) read it.

There is a consideration of the production of the article or book first as a whole, then by paragraphs, and finally as sentences. Any physician would learn to read more objectively after reading or scanning this book. For one who is contemplating writing a book or thesis or a number of papers, invaluable help would be obtained.

The book is interesting reading; it is printed with clear type and good format; there is much valuable information. The only drawback is that so few are apt to read it, since they will feel they do not need a book on medical writing. It is deserving of a wider distribution than it will probably get.—O.R.C.

Fluid and Electrolytes in Practice. Second Edition. By Harry Statland, M.D. Published by J. B. Lippincott Company, Philadelphia. 229 pages. Price \$6.00.

This is a dandy book for the clinician who is faced with fluid and electrolyte balance problems. Though not a comprehensive treatise, this volume is packed full of valuable information. Data are well presented in a clear easy to read style. Each sentence is direct and terse. The author has done a remarkable job in putting a maximal amount of information in a minimal number of words. The book is intended primarily as a teaching primer and is just that. Discussion of controversial experimental data has been avoided. Numerous diagrams are used advantageously to supplement the text.

The book is divided into two sections. The first deals with basic principles of fluid movement and major abnormalities of volume, concentration, and acid-base balance. The problems presented by various surgical situations are also dealt with in this section. The second section discusses fluid and electrolyte disturbances in various clinical conditions such as heart disease, kidney and urologic disease, diabetic acidosis, burns, cirrhotic ascites, and toxemia of pregnancy. There is also a discussion of pediatric fluid balance. The sections dealing with potassium metabolism and its excretion have been largely rewritten. The role of ADH in the post-traumatic state has been stressed. A discussion of salicylism has been added to this edition.

Although some of the discussions in various clinical states are necessarily on the brief side, the reader is presented with a bibliography of over 200 references from which he can get further information on a given subject.

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Levin, S.J.: *Pediat. Clin. North America* 1:975, Nov., 1954.

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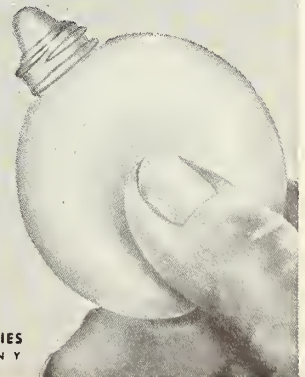
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This volume is a valuable addition to any physician's library since it is the type of book that one will want to reread periodically.—*W.G.C.*

Regulation and Mode of Action of Thyroid Hormones. Ciba Foundation Colloquia on Endocrinology, Volume X. Edited by G. E. W. Wolstenholme and Elaine C. P. Millar. Published by Little, Brown and Company. 309 pages. Price \$8.50.

This collection of 18 very technical papers represents the most recent thinking about the regulation and mode of action of the thyroid hormones. The papers themselves are much too involved to be of interest to most medical readers, but the discussions following each paper are more readable and contain all the pertinent points. The subjects discussed are as indicated by the title of the book and in themselves represent summaries of the present thinking along those lines. All in all, this is a good reference book about this aspect of thyroid physiology.—*J.W.S.*

ANNOUNCEMENTS

Twenty-second annual congress, U. S. and Canadian Sections, International College of Surgeons, Palmer House, Chicago, September 8-12. Three-day program on surgical problems of eye, ear, nose, and throat, beginning September 9. Section on Plastic and Reconstructive Surgery, beginning September 9.

Twenty-second annual meeting, Mississippi Valley Medical Society, Sheraton-Jefferson Hotel, St. Louis, September 25-27. Panel discussions on burns, obstetrics, acute surgical abdomen, peptic ulcer, pediatric chronic diseases, headache. All A.M.A. members invited. Write Secretary, 209 W.C.U. Building, Quincy, Illinois.

Clinical congress, American College of Surgeons, Atlantic City, October 14-18. Information available from College, 40 East Erie Street, Chicago 11, Illinois.

Fourth annual meeting, Academy of Psychosomatic Medicine, October 17-19, Morrison Hotel, Chicago. Program on "Psychosomatic Aspects of Obstetrics, Gynecology, Endocrinology and Diseases of

Metabolism." Secure information from Secretary, 104 South Michigan Avenue, Chicago 3, Illinois.

Three postgraduate courses on diseases of the chest offered by American College of Chest Physicians, (1) Hotel Knickerbocker, Chicago, October 21-25; (2) Park-Sheraton Hotel, New York City, November 11-15; (3) Ambassador Hotel, Los Angeles, December 9-13. Tuition \$75. Write Executive Director, 112 East Chestnut Street, Chicago 11, Illinois.

Orthopedic fellowships for advanced training in teaching or research available from National Foundation for Infantile Paralysis, 301 East 42nd Street, New York 17, New York. Applications received from physicians eligible for board certification until September 1.

Ureteral Injury

(Continued from Page 512)

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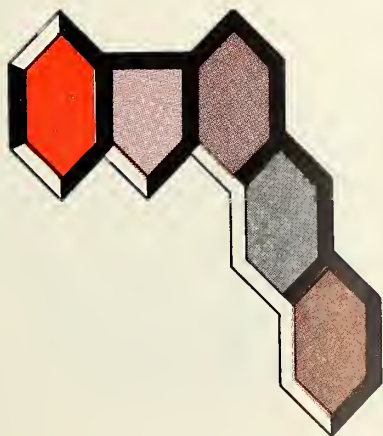
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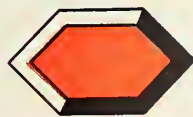
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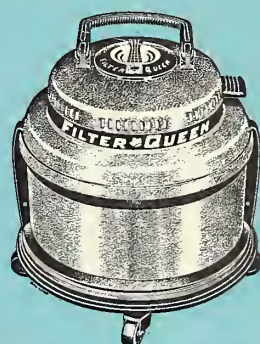
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ABSTRACTS FROM CURRENT LITERATURE

Mentally Afflicted Children

Goldstein, Hyman: Physical therapy and rehabilitation for mentally afflicted children, Arch. Ped. 73:9, 321-337 (Sept.) 1956.

Mentally afflicted children are the end result of vast variety of etiological factors. About 60 per cent of these children are mentally retarded and 40 per cent, approximately, have epileptic seizures. If proper treatment is given, many of these children are markedly improved both physically and emotionally.

Cortical lesions occur in about 65 per cent, resulting in the spastic form of cerebral palsy. The choreiform-athetotic type occurs in 20 per cent of the children, a lesion in the basal ganglia. A tremor type has similar origin and is found in 2 per cent of the cases. The ataxic form occurs in 8 per cent. There are about 500,000 cerebral palsied children in the United States, and thousands of new patients are born each year.

Treatment: The physical therapy or training period for the cerebral palsied child is a long, slow, and tedious one. There are 15 modalities for the treatment of all types of cerebral palsy: massage, passive motion, active assisted motion, active motion, resisted motion, conditioned motion, automatic or confused motion, combined motion, rest, relaxation, motion from relaxed position, balance, reach and grasp, reciprocation, skills.

The children may need medical aid of many types during their periods of physical training, including anticonvulsants, tranquilizers, endocrines, vitamins, mineral supplements, and dietetic regulations. Hearing and vision disturbances must be corrected. Educational and vocational guidance and training develop a better personality, independence, and social maturity.—D.R.D.

Juvenile Diabetes

Brown, Edward E.: Infectious origin of juvenile diabetes, Arch. Ped. 73:6, 191-198 (June) 1956.

The history of onset of diabetes is easier to trace in children than in adults. There is considerable evidence that infection may cause diabetes.

History of diabetes preceded by infection is common. Various authorities report the following incidence of infection preceding juvenile diabetes: Joslin 15 per cent; Landabura and Magdalena 23 per cent;

Toverud 26 per cent; John 32.8 per cent; Fischer 35 per cent; Boyd 56.2 per cent; White 98 per cent, and Friese and Jahr 75 per cent.

The more common infections are measles, scarlet fever, varicella, mumps, influenza, pertussis, pneumonia, acute coryza, acute tonsillitis, and sinusitis. The interval following infection and diabetes developing varies from 10 to 30 days.

Diabetic coma following infection is frequently the time of initial diagnosis of diabetes. Onset of diabetes is more common during the stormy months of the year. Usually improvement occurs during summer months. The pancreas seems to have much more ability to regenerate when the toxic assault upon it is most minimal.

The highest incidence of diabetes exists in climates where streptococcal infections are more prevalent. There is a much higher diabetic death rate in temperate than in tropical climates.

Sinusitis, in the author's opinion, is the most common antecedent infection. Chronic tonsillitis and sinusitis are common in juvenile diabetes.

Diabetic children usually have increased sedimentation rates and increased capillary fragility. Darschner and his co-workers reported that 90 per cent of diabetics with increased capillary fragility also had retinopathy. Chronic sinusitis, elaborating streptococcus toxins, is a frequent focus for both retinitis and nephritis.

Pathologically, John found definite pancreatic changes in about 96 per cent of children. Most show hydropic degeneration of the Islets of Langerhans, resulting in hypofunction. The beta cells in the islets, containing granules which are precursors of insulin, are usually partially or completely degranulated. This condition is also found in experimental diabetes in rats.

The strong persistence of the diabetic state may well be due to the continuous prolonged attack of toxins on the pancreas. Penicillin therapy has favorably influenced the prognosis in infantile diabetes.

The heredity factor is found in from 25 to 40 per cent. Although infection seems to be the most common precipitating cause, it is impossible to demonstrate bacterial toxins in blood or in the pancreas. It seems similar to the arthritic manifestations of streptococcus infections. Streptococcus toxins injure not only the pancreas; they also affect pituitary and other endocrine glands.

Rheumatic children, both diabetic and non-diabetic, and children with chronic infections, show a high incidence of diabetic-type glucose tolerance curves. Some of these children become diabetic after an acute infection, or after continuing low grade infection. Treatment of acute upper respiratory infections, chronic sinusitis, tonsillitis, and other foci of infec-

A REPORT ON A PROMISING CONCEPT IN ANTIMICROBIAL THERAPY: CONCURRENT ADMINISTRATION OF CHLOROMYCETIN AND GAMMA GLOBULIN

In treatment for infection, the physician is confronted with complex interactions between pathogen, antimicrobial agent and host. The pathogen represents the unselected factor, the therapeutic agent the component over which the physician exercises maximum control. But even with optimal antibiotic therapy, the eventual elimination of the infective agent and the resolution of pathologic changes depend upon efficient host response.^{1,2}

Passive transfer of antibodies through gamma globulin provides a broad antibacterial spectrum because of origin in adults exposed to a variety of microorganisms. Employed as a protective element against some of the more common contagious diseases, gamma globulin permits more competent participation by the host in the fight against established infection.

Rationale for immuno-antibiotic therapy lies in simultaneous direct attack on the pathogen and re-enforced host resistance, which implies usefulness in treatment for acute fulminating, highly refractory, or prolonged infections.

EXPERIMENTAL STUDIES ENCOURAGING

In carefully controlled studies in mice, Fisher and his colleagues in Parke-Davis Research Laboratories, using pooled human gamma globulin and Chloromycetin (chloramphenicol, Parke-Davis) concurrently, demonstrated a high degree of therapeutic effectiveness in infected animals.³ Five types of infection induced with species of *Staphylococcus aureus*, *Streptococcus pyogenes*, *Proteus vulgaris* and *Pseudomonas aeruginosa* responded to joint therapy with gamma globulin and Chloromycetin, each agent having shown at deliberately low doses in previous work little or no activity in these mouse infections when used separately. Fisher's experiences with hemolytic streptococci have been confirmed.⁴

Tests now in progress with pneumococci, salmonellae and additional strains of pseudomonas and proteus indicate that marked increases in survival rates may be anticipated in any infection where chloramphenicol has previously demonstrated therapeutic activity.³ These observations suggest that immuno-antibiotic therapy can effect cures in a variety of refractory microbial diseases.

PROMISING IN EARLY CLINICAL TRIAL

Observations analogous to those of Fisher have been reported from the clinic.⁵⁻⁷ More recently, the clinical use of gamma globulin in conjunction with antibiotics was undertaken by Waisbren⁸ on the basis of Fisher's experimental work. His series of 46 patients with systemic and localized infections due to various strains of staphylococcus, pseudomonas, salmonella, proteus and to the pneumococcus had failed to respond to maximum effort with conventional therapeutic measures. Marked clinical improvement in

six of these acutely ill patients shows clearly "...that in certain instances the addition of gamma globulin to antibiotic therapy may give a clinical result that could not have been obtained with the antibiotics used alone. In each of these cases, a long and extensive control period in which antibiotics were being vigorously administered had failed to produce a response but when gamma globulin was given with approximately the same dosages of antibiotic, rather marked improvements occurred."⁹

While the precise mechanism underlying the salutary effect of gamma globulin remains to be clarified, the existence of quantitative hypogammaglobulinemia was ruled out in patients in this series.⁸

A RATIONALE FOR IMMUNO-ANTIBIOTIC THERAPY

Although the relationship of susceptibility to infection and status of the host is well recognized, host resistance is an aspect of infectious disease still not understood in an era of extensive and of massive antibiotic therapy. Most antibiotics, in concentrations tolerated by living tissues, have bacteriostatic rather than bactericidal effect. In the clinic, bacteriostatic doses are most frequently given and host defense mechanisms are responsible for the eventually satisfactory clinical result.⁴

The problem of therapeutic failures despite vigorous courses of antibiotic therapy may be due to some disturbance in the immune process.⁹ In addition, disproportionately high mortality rates in the extremes of life lend support to the impression of inadequate defense mechanisms, since these are underdeveloped and immature in the very young and may be impaired or depressed in the aged.⁴

Any discussion of immuno-antibiotic treatment must at present remain largely conjectural. From preliminary evidence, however, this approach to therapy appears worthy of consideration, especially in patients in whom adequate antibiotic therapy for active infectious processes has been disappointing. While the concept of enlisting the aid of the host in combating pathogenic microbes, thereby affording the physician control of two of the three principal interacting factors, is not new, enhancement of host resistance through use of gamma globulin in treatment for microbial disease is indeed a promising one.

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Sodium and Potassium

Studies of Changes in Their Excretion Following Neurosurgical Operations

A. LOWENTHAL, M.D., A. SOETENS, M.D., and
M. VAN SANDE, *Antwerp, Belgium*

Recent reports have focused attention on important modifications in electrolyte metabolism following general surgery and on ways of rapidly restoring the electrolyte balance in postoperative patients. So far, however, little has been done to study electrolyte balance in the postoperative period following neurosurgery. It is the purpose of this paper to report on changes in urinary excretion of sodium and potassium in 33 neurosurgical patients.

There are several means of investigating changes in body electrolytes, but all save one have distinct drawbacks. It is impractical to make repeated biopsies in order to investigate tissue content of sodium and potassium. It is also impractical, if not foolhardy, to do repeated spinal taps on patients who have just undergone neurosurgery. The great difference in potassium concentration between the red cells and the serum renders blood tests somewhat unreliable. Since feces contain less than 15 per cent of all potassium excreted from the body, feces analysis would not give valid results. Urine, therefore, is the most useful source of material.

The urinary excretion of sodium and potassium is undoubtedly modified by many factors: the age of the patient; his general state of hydration; the diet received in his postoperative period; his fluid intake

and the administration of various medications and antibiotics; the type of anesthesia; the loss or retention of urine, and possibly the type of neurosurgical procedure. Since our study was performed on an

Neurosurgical intervention results in temporary modification of sodium-potassium metabolism in a manner similar to that observed following any type of surgery. These modifications are more apparent in patients who have undergone intracranial surgery than in those who have had surgery of the spinal canal. The modifications of potassium metabolism can be brought back to normal by the administration of potassium by mouth. The modification of sodium and potassium metabolism was not found in non-surgical patients who received artificial feeding and fluid therapy when comatose or semi-comatose.

From the biochemical research laboratories of the Institut, Bunge, Berchem-Antwerp, Belgium. The authors acknowledge the help of Charles M. Poser, M.D., University of Kansas Medical Center, Kansas City, who gave advice with regard to translation into English during his stay in Belgium as a Fulbright research fellow in neuropathology.

active neurosurgical service, it was not possible to submit all of the patients under investigation to absolutely controlled conditions. Nevertheless, we hope to show that various patients, regardless of their age or sex, demonstrated comparable modifications of sodium and potassium metabolism as measured in their urine.

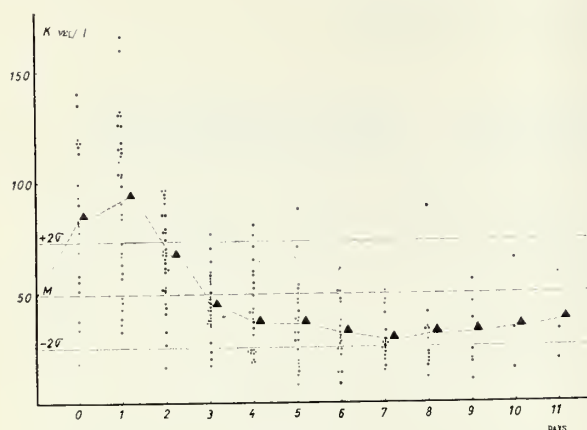


Figure 1

A variety of neurosurgical procedures were performed on the patients. There were 12 cases of spinal cord surgery comprising rhizotomy, removal of herniated nucleus pulposus, and operations on extra and intramedullary neoplasms. Eighteen of our patients underwent intracranial exploration for meningiomas, gliomas, posterior fossa tumors, and metastatic tumors.

Method of Investigation

Twenty-four-hour urine collections were begun four days prior to the operation and continued for ten days thereafter. The sodium and potassium content of each 24-hour specimen was measured

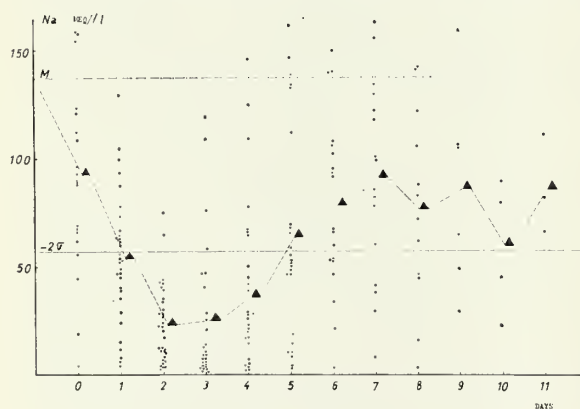


Figure 2

by the Perkin-Elmer flame photometer and expressed in milliequivalents. In addition to showing the absolute values of sodium and potassium, we employed the sodium-potassium ratio in milliequivalents as an expressive index of electrolyte change in the postoperative period.

Results

The over-all results are shown in Figures 1, 2 and

3. Figure 4 represents a typical pattern obtained in one case.

Figure 1 shows an increase in the elimination of potassium after surgery which starts during the first 12 hours on the day of operation. The excretion tends to be four times its average normal value. On the third postoperative day this excretion returns to a normal value, but then it continues to decrease as if to indicate retention of exogenous potassium by the organism.

Figure 2 indicates a decrease in sodium excretion which starts immediately after surgery and reaches its minimum value on the second and third post-

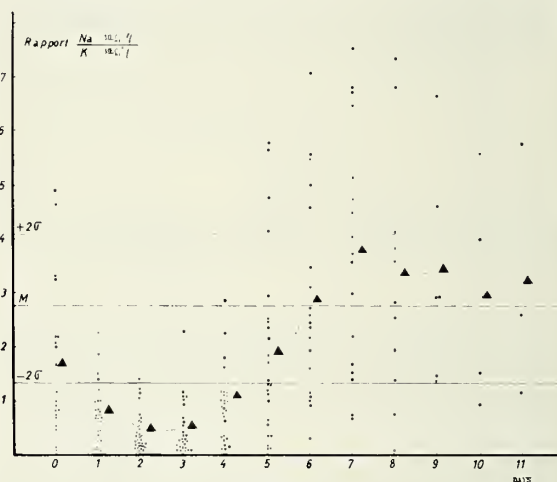


Figure 3

operative days. The sodium excretion then increases progressively, but it still remains below normal until at least the eighth postoperative day.

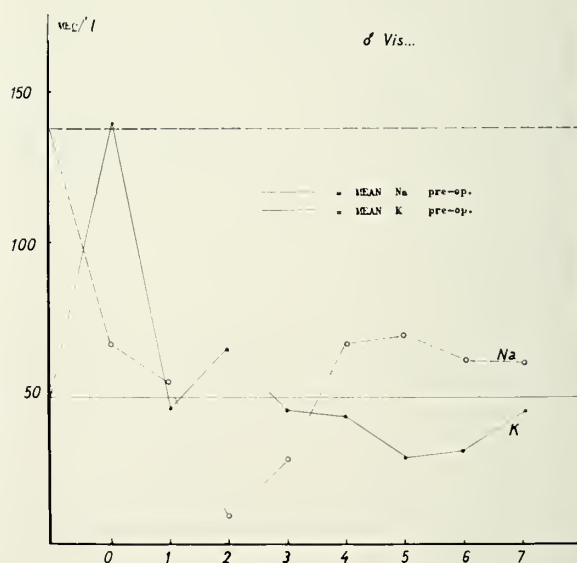


Figure 4

In the postoperative period, therefore, there seems to be an ionic retention which results in a decrease of the sodium and potassium elimination, although there is an initial transitory increase in potassium excretion which lasts approximately 24 to 48 hours.

In Figure 3 this ionic retention is shown by the sodium-potassium ratio expressed in milliequivalents. Before surgery this ratio has a mean value of $2.7 \pm .7$ (95 per cent of our ratios ranged from 1.3 to 4.1); following surgery this ratio decreases immediately and reaches a minimum value after the second postoperative day. By the seventh day the ratio has returned to its preoperative normal although both absolute potassium and sodium values are still low.

From these results we have drawn the conclusion that the patient's critical period with regard to electrolyte balance begins on the third postoperative day and lasts until approximately the eighth day, at which time he is considered to have regained his electrolytic equilibrium.

We have analyzed our cases of surgery on the spinal cord separately from those of surgery on the skull and its contents. The average lowest point of the sodium-potassium ratio in cases of spinal cord surgery is .40 and it ranges between .04 and 1.38. In only three instances did this ratio fall below .10. The first of those three cases was an intramedullary tumor which proved to be inoperable, in which the dura could not be closed; the second one was a high cervical exploration for paraplegia without tumor in a patient with an albumino-cytologic dissociation, while the third was an instance of epidural hematoma in a diabetic patient.

In our cases of intracranial surgery, the lowest values of the sodium-potassium ratio had a mean of .16 with a range of .02 to .54 with eight instances of the ratio being below .1. The high ratios were found

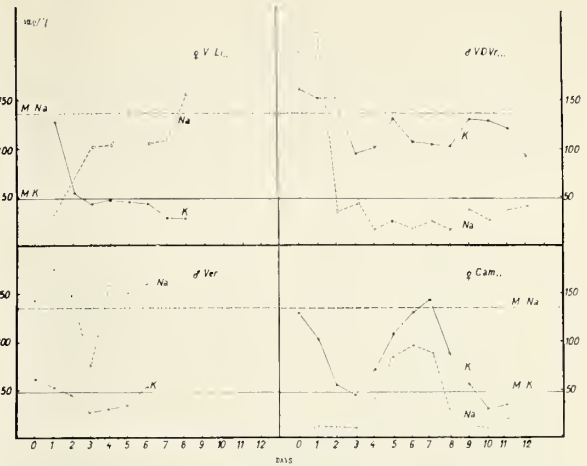


Figure 6

in a patient who had a biopsy of a left temporal glioma (.43) and an occipital lobectomy for glioma with an opening into the ventricle (.54). However, a patient who had undergone a biopsy of a left temporal glioma gave a very low value. Two patients who had had ventriculography and were not included in this series gave a ratio which never fell below 1.02 in the first case and .20 in the second. The sodium-potassium ratio reached its lowest value at somewhat different times during the postoperative period in different cases. The duration of the greatest drop in the ratio is also quite variable, and the significance of the variations is unknown.

Even though our results are so far incomplete, it would seem that intracranial surgical intervention modifies metabolism of sodium and potassium more severely than does intraspinal surgery.

We have had occasion to compare the change of sodium and potassium metabolism in two patients, first following ventriculography and then following exploration of the posterior fossa. In both cases no actual operative intervention was carried out. Figure 5 shows that the departure from normal was more pronounced in the patients after posterior fossa exploration than after ventriculography.

We carried out electrolyte balance studies in two patients who were not subjected to surgical intervention but who were semicomatose and receiving intravenous fluid therapy. Table I shows our results and demonstrates that even in patients who are in what superficially resembles a postoperative state there are no apparent modifications of sodium and potassium metabolism such as result from surgical trauma.

Discussion

We have been able to confirm the observations previously obtained by other researchers (Blixenkrøne-Moeller; Snyder and Snyder; Randall, Habif,

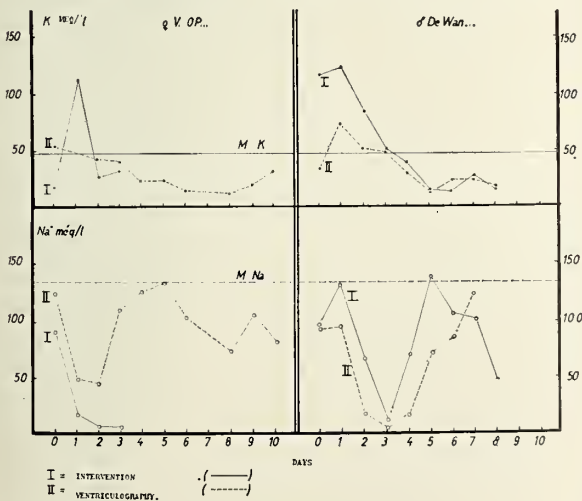


Figure 5

TABLE I

| | Date | K mEq/L | Na mEq/L | Na/K ratio |
|--------|------|---------|----------|------------|
| case A | 1/5 | 61.5 | 25.6 | 0.41 |
| | 1/6 | 63.5 | 47.0 | 0.47 |
| | 1/7 | 52.7 | 103.0 | 1.94 |
| | 1/8 | 47.4 | 108.0 | 2.30 |
| | 1/9 | 40.4 | 91.0 | 2.26 |
| case B | 1/10 | 50.9 | 68.0 | 1.34 |
| | 1/13 | 42.0 | 127.0 | 3.01 |
| | 1/14 | 54.5 | 153.0 | 2.80 |
| | 1/16 | 46.9 | 167.0 | 3.59 |

and Lockwood; Woringer, Baumgartner, and Lienhart). These authors reported an increase in potassium elimination during the first two or three days and a decrease in sodium excretion toward the fourth postoperative day in cases of general surgery.

It has been said that the change in urinary potassium excretion parallels destruction of tissue through surgery. Several authors, however, have shown that the nitrogen loss does not follow the same curve as the potassium loss in urine (Lans, Stein, and Meyer, and Elman, Shatz, Keating, and Weichselbaum); therefore, it seems hardly logical to accept the severe potassium loss immediately after surgery as being the direct effect of tissue destruction. In our own cases we have observed a considerable increase in potassium excretion in the course of only a relatively minor tissue injury such as that incurred by placing a ventricular drainage tube.

Other authors have tried to explain the modification of sodium-potassium metabolism on the basis of an alarm reaction dependent upon endocrine mechanisms. Interesting work along this line has been published by Gros, Minvielle, and Vlahovitch. These authors plotted a curve of the total blood eosinophile count after neurosurgical operations, which seems to be remarkably close to the variation curve of the sodium-potassium ratio we have observed. This tends to support the hypothesis that electrolyte modifications are indeed related to a stress reaction and that increased potassium elimination in the urine and hypokalemia are the result of a potassium deficiency in the tissues following surgery. It has been demonstrated by Blixenkrone-Moeller and Evans that serum potassium levels are poor indicators of the actual metabolism of potassium in the postoperative period. The report published by Eliel, Pearson, and White on measurements of potassium in muscle biopsy specimens seems to support this contention.

Wise has recently published an article on the changes in potassium and sodium metabolism following neurosurgery. He noted loss of potassium and

retention of sodium, but he did not make clear the time relationship of these metabolic changes. He has reported his observations in five cases, of which three were chromophobe adenomas with endocrine changes, one was a cerebellar tumor with increased intracranial pressure, and last was a case in which ventriculography was performed for unlocalized increased intracranial pressure. These cases somewhat resemble the ones analyzed by Cooper. Wise's bibliography is extensive.

The most striking change in electrolyte balance during the first hours after surgery is the increased elimination of potassium. It is conceivable that this results in the eventual decrease of sodium elimination by bringing about an actual loss of cellular sodium. However, before accepting this hypothesis, the following facts must be considered:

A. Some urinary excretion of potassium is necessary, since it never falls below a certain minimal value in normal individuals.

B. Sodium excretion in the urine seems to be much more variable and may in certain cases be almost nil.

C. The increase in potassium and the diminution of sodium in the urine do not occur simultaneously, nor do they follow a linear relationship.

D. We have found that correcting the loss of potassium may either abolish the sodium retention, diminish its importance, or postpone its occurrence.

We administered potassium by mouth to four of our patients. The resulting curves of elimination of sodium and potassium and the variations of the sodium-potassium ratio in the urine are shown in Figure 6. The administration of potassium by mouth (10 grams of potassium chloride per day) did not result in an exaggerated loss of potassium in the urine. On the other hand, in one case it seemed to have brought the sodium-potassium ratio back to the normal range after the third day.

In a second case (Cam), the sodium-potassium ratio, which had been maintained at a normal range for eight days by administration of potassium by mouth, fell to an extremely low value when potassium was stopped, and was again brought back to normal when potassium administration was resumed. In case Ver (a patient who was a poor operative risk), the sodium-potassium ratio remained high and the excretion of sodium remained low despite treatment. In case Vdv, the administration of potassium chloride was rather irregular, and the results were less definite, especially in view of the fact that the patient developed postoperative infection which necessitated the administration of many medications, including antibiotics.

In patients receiving potassium by mouth the excretion of potassium in the urine after neurosurgery

(Continued on Page 626)

Tuberculosis in Kansas

A Study of Its Past, Present, and Future

MARTIN J. FITZPATRICK, M.D., *Kansas City*

To visualize more clearly the position of tuberculosis in Kansas today, and to consider some of the changes that probably await us in the future, it would appear wise to review briefly some of the events relating to this disease that have taken place in this state since it was formally constituted in 1861.

During the period of migration of eastern and middlewestern pioneers to Kansas in the last third of the 19th century, there is no known record of the extent of tuberculous infection in this state. At that time there was no official organization to record or to deal with the majority of public health problems on the frontier.

The first changes in tuberculosis control in the new state of Kansas probably had their impetus from the organization in 1904 of what is today the National Tuberculosis Association. Dr. Samuel J. Crumbine, first secretary of the Kansas State Board of Health, attended several of the early organizational meetings of the N. T. A. on the eastern seaboard. In 1907 an International Congress on Tuberculosis was held in Washington, D. C. At that meeting Dr. Crumbine met and discussed tuberculosis and related topics with such outstanding leaders as Trudeau, the American pioneer; Koch, the discoverer of the tubercle bacillus, and Calmette, the French leader in tuberculosis research at that time. Dr. Crumbine returned to Kansas filled with enthusiasm for organizing a tuberculosis program in this state. He received a sympathetic ear from Governor E. W. Hoch and suggested that a meeting of all interested citizens be called to organize a tuberculosis control program.

The first formal meeting concerned with this disease in Kansas was held on December 3, 1908, at the state house in Topeka, and from this the Kansas Association for the Study and Prevention of Tuberculosis, the parent of our present state tuberculosis society, was formed. In 1908 the first Christmas seal sale was held in Kansas, with an extremely modest yield. Gradually, through the years that followed, a corps of dedicated volunteer tuberculosis workers grew in Kansas, to the extremely effective level that exists today across the state.

One of the early points for emphasis established

by the leaders of the budding national organization, especially Dr. Trudeau, was the need for health education of all people. As early as 1905 he had stated, "The first and greatest need is education—education of the people, and through them, education of the state." In retrospect that was a most intelligent move, for the problem of tuberculosis far exceeded the knowledge, skill, or interest of the medical profession of that day. Its ultimate control depended on solving the major social and economic problems that could only be dealt with by combined interest and action of individuals from all walks of life.

With the stimulus of this new organization attempting to control tuberculosis in Kansas, the state

Many changes have taken place in tuberculosis therapy in the past 50 years. Today's chemotherapy can be administered by any practicing physician. Although hospitals for the care of tuberculous patients are still necessary, physicians at those institutions are no longer caring for the majority of patients with the disease. Future control of tuberculosis in Kansas will depend more on the practicing physician than it has in the past.

legislature in 1911 enacted a law authorizing the creation of a state sanatorium for the treatment of this disease. In that year they appropriated \$50,000 "to be used to purchase the proper site, to erect and to equip the necessary buildings, and to pay the running expenses for a period of two years." It is of interest that a tract of 240 acres just two miles west of Newton, in Harvey County, was selected to be the site for the sanatorium. Some difficulty was encountered in obtaining possession of the land, and the matter was still unsettled when the 1913 legislature convened. That body repealed the old law and enacted another, which further provided that the sanatorium be located in any county where 160 acres of land would be donated free of charge to the state.

Following this, an advisory commission and a superintendent toured many counties of Kansas looking for the site for the new tuberculosis sanatorium.

Presented at a meeting of the Tri-County Medical Society, Newton, June 3, 1957. Dr. FitzPatrick is president of the Kansas Trudeau Society.

In July 1913, while the group was in Norton County, the businessmen of Norton approached them and told them to select whatever area in the county they liked best with the understanding that this land would be given to the state. They promptly took up this generous offer, and "160 acres of fine land" were donated. Another 80 acres were later purchased, thus making a total tract of 240 acres.

Construction of the sanatorium was started in October 1913, and the cornerstone of the first permanent building was laid in June 1914. The first pavilion was completed in September 1914, and the new sanatorium was opened as a 16-bed unit in February 1915, with Dr. C. S. Kenney as superintendent. From this rather humble start, the hospital grew steadily and assumed a most important role in treatment of this disease in Kansas.

In 1908, when the Kansas Association for the Study and Prevention of Tuberculosis was first organized, there were approximately 5,000 cases of active disease in this state with a population but a fraction of today's. Early statistical reports suggest that more than 100 people died from this disease in Kansas every month. Some 30 year later, by 1938, even before the advent of modern therapy, the death toll in Kansas had dropped to around 428 per annum. By 1941, Kansas was among the six states with the lowest annual death rate from tuberculosis. This decline in tuberculosis mortality was actually a nationwide one, representing a true triumph of preventive medicine and improvement of living and working conditions across the country at large.

During this time other advances in the changing picture of tuberculosis in Kansas were evident. In 1941 the legislature, looking at the major problem of silicosis and tuberculosis in the southeastern corner of the state, started the long road of legislative action that eventually resulted in building a modern tuberculosis hospital at Chanute, to deal with severe local problems of tuberculosis and silicosis. Other changes have included the appropriation of funds to build a modern unit at the University of Kansas Medical Center, to serve as a center for the teaching and training of future doctors and nurses in a changing approach to tuberculosis and other pulmonary diseases. An important aspect of this new approach to the teaching of pulmonary disease was the early recognition by the Kansas Tuberculosis and Health Association of the need to endow a full-time chair in this specialty at the university, a program that is now being followed by other states.

It might be well to consider what has happened to the picture of tuberculosis outside Kansas, and to reflect briefly on major advances in treatment of this disease that have revolutionized our approach to it. By reflection on events that have taken place in the

recent past, we often can get some inkling as to the future course of tuberculosis control both in the nation and in this state. Let's go back some 50 years to the start of the 20th century.

At that time tuberculosis was the number one killer of our civilization. This was most marked in cities along the eastern seaboard, but it gradually also became a problem of other areas as the rising tide of population moved westward. As we have seen, this great problem of tuberculosis actually brought into being the national, state, and local volunteer groups that were to deal so effectively with it. Some 50 years later, the fruits of this effort are readily apparent by the striking decline in tuberculosis across the nation. Along with great changes in the picture of this disease in human beings, the once formidable problem of tuberculosis in cattle has been practically eliminated. All of this occurred before there was a specific form of treatment for this disease.

The major approach to treatment of patients ill with this disease prior to World War II, was in the use of non-specific regimens; bed rest and collapse of diseased lung. Rest, of course, was the major form of therapy up to that time, that had been effective in restoring some patients to a useful and a fairly healthy life. If cavitory disease was present, artificial pneumothorax was the most widely used form of collapse treatment. It has been estimated that three-fourths of all patients entering a tuberculosis sanatorium prior to the advent of chemotherapy received pneumothorax at one time or other. In patients with more severe cavitory disease which resisted collapse by pneumothorax, or with a complication of pneumothorax, the major surgical procedure resorted to was primary thoracoplasty. By removing ribs, the destroyed lung with its cavities would then be allowed to retract and, thus enhance healing in the resting lung.

During the years preceding World War II, tuberculosis patients were removed from their home environment, principally from cities where the disease was most rampant, to be treated for prolonged periods in rural, isolated sanatoria. The healers of tuberculosis consisted of a small group of physicians and nurses in these sanatoria whose interest in this disease had been aroused, usually by having been victimized by it. After a patient was discharged, follow-up was conducted primarily at the sanatorium when this was physically possible, or in some centrally located chest clinic, often in the community in which the patient lived. Very strong ties were thus established between the majority of tuberculosis patients and the physicians treating this disease. In general, active tuberculosis patients were shunned by most physicians in everyday practice. It evolved that only a few physicians were either capable of or interested in treating the large army of tuberculous individuals.

The first great change in this rather peculiar form of medical practice was one that was largely unnoticed at the time by most tuberculosis workers. It was the demonstration of the marked anti-tuberculous activity of streptomycin by Schatz, Waksman, and co-workers at Rutgers University in the early 1940's. Following this brilliant discovery, clinical trials were performed in many areas throughout the country, and it was soon established that streptomycin was the most effective substance known to date capable of altering the course of tuberculosis. We are all familiar with the early drawbacks that were soon found with this drug, its expense, impurity, eighth cranial nerve toxicity, and the early emergence of bacterial resistance. All of these factors at first limited the widespread use of this new drug in treating tuberculosis—a chronic disease often spread over many years.

The next significant step in the evolution of modern treatment of this disease came from Sweden in 1947, with the demonstration by Lehman and co-workers of the anti-tuberculous effect of para-aminosalicylic acid (PAS). These scientists demonstrated that this new drug was effective in patients who had developed streptomycin-resistant organisms as well as in the sensitive patient. PAS was also found capable of delaying the emergence of streptomycin-resistant bacilli, when used in combination with this more potent drug. For the first time we were able to prolong the anti-tuberculous effect of streptomycin and to delay, and in some instances to prevent, the emergence of resistant organisms. Thus, chemotherapy of tuberculosis advanced beyond short-term use to control critical emergencies into the area where drug therapy could be given for periods of a year or more, if needed.

Large scale clinical trials were conducted in this country by the U.S.P.H.S. and the Veterans Administration and in England by the British Medical Research Council. From them, the regime of combined streptomycin and PAS emerged by 1951 as the standard form of treatment of tuberculosis of all organ systems. At this time most patients were receiving tuberculosis chemotherapy in sanatoria or hospitals designed for treatment of this disease, and little treatment was administered outside of these few institutions.

This situation was profoundly changed in a few years by demonstration of the great therapeutic effect of isoniazid (INH) in tuberculosis patients early in 1952. This new synthetic drug was found to be even more effective than streptomycin in treating the disease. In the years that followed its introduction, various regimens were studied in many clinics throughout the country. It was noted that isoniazid could be used in combination with either PAS or

streptomycin and that this drug diffused readily into the central nervous system and appeared in high concentration in the cerebrospinal fluid. Thus, it became an extremely effective agent in the treatment of tuberculous meningitis, and no longer did physicians have to resort to intrathecal administration of streptomycin in these patients.

These and other changes in treatment of tuberculosis within the past decade have had a profound effect on the older and more non-specific forms of therapy. Today we are seeing studies suggesting that strict bed rest is no longer necessary for most patients, and that it actually may do harm in certain types of tuberculosis in children. We have witnessed the almost complete removal of artificial pneumothorax as a form of treatment in this country. We have seen the development of resectional surgery of tuberculous cavities and other lesions, a form of treatment that could not be carried out before appropriate drug therapy was available. And, of course, we have seen the relentless prolongation of drug therapy in this most chronic of all infectious diseases. From this latter event we now have evolved a method of treatment that can be considered truly "curative" in most patients if properly used.

Another product of the development of adequate chemotherapy, most marked in the years since the advent of isoniazid, has been the fact that treatment of tuberculosis has been removed gradually from the hands of a few and placed in the hands of any physician in the United States. This phenomenon has naturally caused considerable reaction and comment on the part of some physicians who are responsible for the treatment of patients in tax-supported sanatoria and in tuberculosis control movements across this country. But despite the majority of these sentiments, home treatment of tuberculosis patients is here to stay, and it will continue and increase in future years because of basic economic and human factors.

Along with these significant changes in the treatment of this disease, we have witnessed others in the composition of the group of patients with tuberculosis. The past 20 years have seen a gratifying reduction in incidence of this disease in younger members of our population, with a proportional rise in the problem of tuberculosis in older people. Today in most of our tuberculosis hospitals a majority of our complicated patients are in the age range of geriatric problems. This means that today's hospital treating these patients must be better equipped, better staffed, and better administered than it was a decade or two ago. These older patients often have other diseases combined with and complicating tuberculosis. This trend will increase in the future, with the continuing prolongation of the life-span of our population.

Against these remarks concerning the past and the

present, it might be well to try to visualize what some aspects of our tuberculosis program of the future will look like. This attempt at clairvoyance is divided into three categories, as outlined below.

1. *Case Finding*—With the decline in morbidity and mortality from tuberculosis in most of our communities across the nation, including Kansas, the future problem of finding new cases early in their course will become more complicated and more expensive. New techniques that are most suitable to each local community will have to be evolved. It is becoming apparent from many studies that mass chest x-ray surveys on a statewide basis are no longer the most efficient nor the least expensive way of finding latent active disease. This effort will probably be replaced gradually by a continuing x-ray survey of those members of the population who statistically have the highest prevalence of infection. Today's x-ray survey will also be fortified in the future by wide-spread tuberculin skin testing programs, again on a continuing basis. From these tuberculin converters, the follow-up on household contacts should be quickly done, and thus the asymptomatic case of tuberculosis will be ferreted out from the general population early in its course.

2. *Treatment*—The number of patients with active pulmonary tuberculosis being treated by physicians outside our hospitals will increase in the future. This will occur despite the protests of physicians or public health workers, and all should honestly recognize this fact. Thus, it would appear wise to try to determine which patients will benefit most from home treatment, and which individuals can be best handled in the hospital. Certainly individuals with demonstrated cavitary disease, or a persistently positive sputum that fails to convert quickly on drug therapy at home, or patients with another significant complicating disease, should be referred early in their course to a hospital specializing in treating tuberculosis. A closer liaison between the family physician and the tuberculosis hospital to insure continuity of management will be of paramount importance.

A fundamental principle of management should be that most patients, including those with tuberculosis, are best cared for whenever possible in their home environment, if it is adequate. This of course, must always preclude the infection of others, for this is still a communicable disease. When this principle cannot be carried out adequately at home, the patient must be isolated until non-infective. Since we are dealing with sick and complicated human beings, this temporary isolation will be accepted more readily if near to the patient's home.

As chemotherapy becomes more effective, as our use of it becomes wiser, and as our tuberculosis case finding becomes better, especially in younger individ-

uals, the number of surgical resections performed for persistent tuberculous cavities will diminish. Indeed some studies already demonstrate that there is no true difference in the patient's course whether or not closed tuberculous lesions are resected or left behind, provided prolonged continuous chemotherapy is used. In the future, surgical treatment of tuberculosis will be more in the nature of a "salvage operation" on an older patient with advanced disease, often with other limiting cardiac and pulmonary factors. Thus, surgical treatment of tuberculosis will tend to become a more difficult problem and will require a team approach to deal with the complicated patient in need of operative help.

3. *Physicians*—In the past there has been a dedicated and highly trained group of physicians who have banded together, mostly in rural sanatoria or other tuberculosis hospitals, to treat most patients with this disease. To these pioneers we owe a great debt, for from them have evolved most of our skill and knowledge concerning today's medical and surgical management of patients with pulmonary disease. It has often been stated in recent years that this group of physicians will disappear; that since the problem of tuberculosis is diminishing and the scene of its treatment is changing, physicians specializing in the treatment of this disease will ultimately "go out of business." In part this is true, for the physician of today and tomorrow will no longer be able to specialize in just the treatment or management of tuberculosis because of many of the factors already mentioned. Instead he will, of necessity, have to be skilled in the differential diagnosis and appropriate management of all abnormalities of the chest that can simulate this "great imitator."

In the past, when tuberculosis was the number one killer, it was also the prime cause of pulmonary pathology in most instances. In recent years, with the decline in mortality from this disease, other problems of the lung have assumed a greater importance and will continue to do so. Thus, the physician of the future will have to be more accomplished in the broader field of pulmonary disease than his forefathers were. There will always be a need for skilled physicians in this specialty, however, to deal with the more complicated diagnostic techniques as they evolve, and to aid in their interpretation and use in patients referred by other physicians.

I have not so far touched on the recent Kansas tuberculosis study, conducted by Dr. Joseph Stocklen and a team of national experts. I think the details of this study are well known to most of you. One of the important things to come from this study is that we now have some idea of where we stand and in what direction we should be moving. Although Kansas is blessed with a low tuberculosis mortality

and morbidity rate as compared with the national figures, it is still too high.

It should be hoped that the number of tax dollars appropriated to take care of today's tuberculosis problem in Kansas can, in the future, be partially directed into other areas. It is also hoped that by streamlining and modernizing our entire tuberculosis program at all levels, this problem can ultimately be more efficiently and less expensively dealt with. However, tax funds will always be required to control this and other communicable diseases in Kansas.

There is little question that the sanatorium at Norton and other comparable facilities in the state will undergo changes that will be dictated by changing medical and social necessities in Kansas. It would also appear logical that some day an appropriate tuberculosis unit will be established as a part of a general hospital in Wichita, in the major center of population and, presumably, of potential tuberculosis in this state. From the Stocklen report we have learned that the major outstanding problems of tuberculosis in Kansas still are confined mainly to its three largest cities and to Cherokee County.

We have also learned of disquieting flaws and defects in our continuing public health surveillance of this disease. The large number of known active tuber-

culous persons in Kansas, not under adequate medical supervision, augurs for an ever greater future seedbed of disease. Changes in the picture of tuberculosis in the past decade can only breed continuing problems until the known sources of infection in our communities are identified and controlled. The recent modernization of our recalcitrant patient law is a step forward against the problem of continuing community infection.

By knowing where our problem is greatest, we can assume a more aggressive program aimed at early detection, adequate treatment, and total rehabilitation of the patient and his family. To accomplish this will require an integrated program combining the skills and accomplishments of medical science, social study, enlightened legislation, and economic assistance both in these communities and across the state at large.

But no program in combating this disease will succeed without the understanding, cooperation, and active support of all physicians in Kansas, for the future control of this disease will rest more squarely on the shoulders of the practicing physician than at any time since Hippocrates.

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Coarctation of the Aorta

Complications of Abdominal Pain and Distention after Surgical Resection

**PAUL H. WEDIN, M.D., KATHERINE PENNINGTON, M.D.,
and FLOYD B. GRILLOT, M.D., Wichita**

Interest in presenting this case was stimulated by an excellent article in the June 1956 issue of the *Journal of Thoracic Surgery*. The article, "Abdominal Pain following Surgical Correction of Coarctation of the Aorta: A Syndrome," was by Dr. Dean M. Ring and Dr. F. John Lewis of Minneapolis, Minnesota. A discussion of the cause of the abdominal syndrome was followed by 18 case reports. Also mentioned was a case presented by Perez-Alvarez and Oudkerk.

We wish to add our report to the literature since many such complications will probably occur in future surgical correction of this aortic abnormality. Another reason for presenting this case is that our patient had an additional complication—atony of the

bladder—necessitating an indwelling catheter for a prolonged period of time.

Our patient, C.S., a four-year-old boy, was found to have hypertension of 210/110 in the right arm

The patient reported here, a four-year-old boy, benefited from surgery although complications followed the operative procedure.

and 200/100 in the left arm. He had had repeated bouts of upper respiratory infections throughout his

life and had complained of weakness, fatigue, and cramping in the legs. Examination revealed absence of pulsation of the femoral, popliteal, posterior tibial, and dorsalis pedis arteries. No popliteal blood pressure was obtainable. The typical purring sensation was felt on palpation of the back, and a humming type of murmur was heard on auscultation. Kidney function studies were normal. A diagnosis of coarctation was made, and surgery was performed on April 17, 1956.

The thorax was opened through a posterior lateral incision in the fourth interspace. Extensive collateral arterial circulation was encountered when the chest wall was opened. The intercostal branches were isolated, ligated, and transected. The recurrent laryngeal nerve was carefully retracted to avoid injury. The ductus was clamped and transected and found not to be patent. The coarctation was then resected, and the aorta was easily resutured. The diameter of the coarctation measured approximately one millimeter. Little bleeding was encountered after the clamps were loosened, and it was easily controlled by pressure. Satisfactory pulses were found in the femoral and dorsalis pedis arteries. The blood pressure at the end of the operation was 140/90. The thorax was closed in the usual manner with an intercostal drain to promote re-expansion of the lung. The patient left the operating room in excellent condition.

Postoperative progress was satisfactory, and the patient voiced the usual complaint of pain in the chest. He also had pain and difficulty in voiding, and after the third day a decreased urinary output was noted. On the fifth day his output measured only 250 cc., so an indwelling catheter was inserted.

On about the fourth day he began complaining of cramping pain in the epigastrium. The next day there was noticeable distention of the abdomen, and the intestinal sounds suggested the possibility of obstruction. X-ray of the abdomen on the sixth day showed dilated loops of small intestine. The abdomen was

still distended, and peristaltic waves could be seen on the abdominal wall. Gastric suction and parenteral feedings were instituted. Carefully calculated electrolytes and fluids were administered intravenously, and he was maintained in normal balance.

On his 11th postoperative day the distention had entirely cleared, and he was passing gas rectally. Gastric suction was then discontinued, and he began taking food by mouth. The indwelling catheter was removed, and the patient began urinating without difficulty. During the period from the fourth to the 11th postoperative day his temperature rose to a high of 102 degrees.

The day after resection of the coarctation, blood pressure of both arms and legs was around 170/110. On the fourth postoperative day Apresoline was started to reduce his blood pressure. It had returned to a level of 110/70 in both arms and legs four days later, so Apresoline was discontinued and the blood pressure did not become elevated again.

After the 11th postoperative day the patient's progress was entirely satisfactory. He was ambulatory and was given a progressive diet. He was dismissed from the hospital in excellent condition on his 15th postoperative day.

The child was still in excellent condition when examined in the office six weeks after surgery. Arm blood pressures were 110/70 and popliteal blood pressures were 100/60. His mother stated that he was active and no longer complained of fatigue or aching in his legs.

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Childhood Granulomas

Report of a Case of Obstructive Growths in the Ear Canals

JOSEPH A. BUDETTI, M.D., and ERNEST M. SEYDELL, M.D., *Wichita*

Among unusual and deceptive conditions which occasionally confront a physician, none can be so baffling as a granulomatous lesion of the ear canal in a one-year-old child. Chronic ear discharge in an infant suggests any number of possible causes, some of which can be a simple medical problem while others can be serious surgical emergencies with all grades between.

The external ear can show eczema, ulcerations, or epidermal infection. The canal may show foreign bodies, impacted cerumen, external otitis of pseudomonas, staphylococcus, fungus or allergic types; granulomas or aural polyps may protrude through drum perforations. Middle ears can show chronic discharging infections through perforations of the drum with or without polypi, as well as allergic exudates. Finally, the mastoid itself may be the basis of the drainage and middle ear granulations.

In our patient, both ear canals were blocked by large papillomatous growths behind which thick, purulent, creamy exudate accumulated. The 21-month-old child was first seen in August, 1955, with a history of drainage from both ears since having a head cold eight months previously. He had been under medical treatment by two different physicians for what gave every indication of being a routine case of bilateral otitis media. Ear drainage had been constant, malodorous, and creamy purulent. Other symptoms were occasional pain and frequent "pulling on the ears" by the child.

The parents were not conscious that the child had suffered a hearing loss since he responded normally to conversation. There was a family history of asthma but no history of allergy in the patient except hives from penicillin. The mother stated that various parenteral and oral antibiotics had been used repeatedly and extensively but could not identify them by name.

On the first examination nothing could be seen because of complete obstruction of each canal by large granulomatous masses bathed in pus. They resembled aural polyps in consistency. The nose and throat were negative except for enlarged tonsils and adenoids. X-rays of the mastoids were surprisingly normal with fair pneumatization even at this young age.

Under general anesthesia the masses were removed by the use of an aural snare and cup forceps. The drum appeared to be intact on the left but indistinct on the right because of bleeding. Gauze packing was

inserted in each ear. Culture of the discharge showed hemolytic staphylococcus only moderately sensitive to two antibiotics and sulfa. Microscopic study showed granulomatous tissue with none of the suspected papillomatous element. Terramycin was given parenterally at first, orally later. The gauze packing was replaced twice on alternate days but was then discontinued because the granulomas appeared to be controlled. Both drums were then seen to be essentially normal.

About two weeks later the discharge recurred and the granulomas reappeared rapidly thereafter. Medication with terramycin was resumed, then changed to syrup Gantrisin. The granulomas were cauterized every four to seven days. Caustics used to no avail in-

Surgical removal followed by pressure packs and simple local therapy proved effective in combating bilateral obstructive staphylococcic epithelial granulomas in a 21-month-old boy. Antibiotics, administered orally and parenterally, were ineffective.

cluded lactic acid, silver nitrate, and Podophyllin in that order. Biomydrin drops were prescribed for local use. By November 29 the right canal was half filled and the left completely filled by papillomatous masses similar to those originally found. Surgery was repeated and both canals were cleared.

The focus of each mass seemed to be midway within the canal at the posterior superior junction with dehiscence of the canal epithelium down to the mastoid bone. The drums were seen to be intact. After excision of the masses, a tightly rolled cotton pack impregnated with Polycin-Otosmosan solution was fitted snugly into each canal. The pathologist again reported the tissue as granuloma with no evidence of papillary stalk.

This time the packing was replaced every other day and fitted quite snugly for pressure. It was continued for three weeks. No oral or parenteral antibiotics were used. After the third week healing appeared complete. Monthly rechecks for the next eight months showed no recurrence. Both canals epithelized well with minimal cicatricial contraction on one side and normal canal on the other. The drums have remained intact.

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Wichita 2, Kansas

PRESIDENT'S PAGE

DEAR DOCTOR:

Fee schedules have provoked much discussion, especially quite recently. Such schedules arose in Blue Shield and insurance plans, compensation laws, VA schedules, and currently Medicare.

Medical societies have been urged to approve fee schedules to establish "usual" fees (whatever "usual" fees are). Former A.M.A. president Ed McCormick sponsored such standardized fees, urged their adoption and publication. But the underlying reasoning is difficult to follow, and widespread professional acceptance has not ensued.

However, the medical society of Erie County, New York, has compiled a schedule of "usual or customary fees." They state, "In all cases of disputes—coming to the Mediation Committee—fees or charges in excess of the customary fee will have to be justified." Hmm!

Are medical services mere commodities salable at so much per each? Are diagnoses, medical judgment, knowledge of proper therapy, surgical skill, of fixed value regardless of who presents them? Regardless of talents, experience, skill, degree of successful accomplishment in one's profession? Is it not fatuous to assume a fixed value for medical service whether it follows a brief training or a five-year residency, whether from scant experience with few cases or from extensive experience in a particular field? Certainly in a freely functioning professional climate the intelligent patient does so conclude.

Ohio doctors refused to sign a Medicare contract with a fixed fee schedule. They say it violates their fundamental principles. Interestingly, they are, nevertheless, partaking in the program. The Defense Department is paying each Ohio doctor the statement he presents showing *his* "usual" fee. The results are reported as quite satisfactory, that fees average very close to the prepared schedules and no abuses are mentioned.

There is a Wisconsin Blue Shield plan without a fee schedule. It pays each doctor *his* "usual" fees, with expected variations. A few abuses were reported; a few took an unfair advantage. To teach the few the facts of life has not proved too difficult. The costs to the plan are said to approximate those of comparable plans with set fee schedules.

The California Medical Society conducted a thorough study, found there was no such thing as a "usual" or "customary" fee. They very ingeniously contrived a "Relative Value Schedule" to indicate by use of proportionate unit numbers, the relative values of various procedures. Our Fee Committee would do well to adopt a similar schedule.

Kansas doctors rejected the proposed \$6,000 Blue Shield contract. Too many felt the fee schedule would establish rigid, inflexible, set fees for all of Kansas and (rugged individualists) they refused to go along.

One wonders if the valiant physicians of Ohio and the Wisconsin group may not have the ultimate solution. Might such a Blue Shield plan without a fee schedule be the ideal answer for Kansas? If, as it purported to be, the \$6,000 plan was based on the "going rates in Kansas," then the proposed subscription charges should furnish ample funds to pay each physician his ordinary charges just as he applies them in his daily practice. Maybe we should consider such a plan and give it careful thought.

Fraternally yours,

A handwritten signature in cursive script, reading "Dante A. Nelson". The signature is fluid and elegant, with a large initial "D" and a long, sweeping underline.

President

EDITORIAL COMMENT

Medicare

Sufficient experience has been obtained under the Dependents' Medical Care Program that the Kansas Medical Society's special Committee on Medicare issues the following statement on some common misunderstandings.

Medicare is a program to assist the dependents of service men and women in all branches of the armed forces. Under limited circumstances which have been carefully defined, the federal government will purchase the services of civilian doctors to care for dependents of service personnel. A short definition always fails to include every possibility, but the following statements are almost correct, at least so much so that a lengthy explanation would be required for the very few exceptions.

Medicare is a program for hospitalized patients. The government defines a minimum hospital stay to be not less than 18 hours unless, after surgery, the patient is discharged in less time, or unless death occurs in less than that period.

There are a few exceptions in which a patient may receive benefits under Medicare and not be in a hospital. The first of these is obstetrical care. The patient may be delivered outside a hospital. If this is done, the patient pays the physician directly the first \$15, and Medicare pays the remainder up to the maximum allowed according to the fee schedule.

The second exception is in the care of accidental injuries which are limited to fractures, dislocations, lacerations, and other wounds. Here also the patient pays the first \$15 if care is rendered outside a hospital. It should be noted that emergency care outside the hospital does not necessarily qualify for Medicare payments.

The third eligible service for care outside a hospital has to do with a limit of \$75 for laboratory and diagnostic fees prior to hospitalization, provided the patient is subsequently hospitalized for that condition, and \$50 for tests and procedures after hospitalization.

A fourth possible exception to hospitalized benefits is radiation therapy if it is begun while the patient is hospitalized and continued after hospitalization.

There have been very few instances in Kansas but some in other states where physicians have charged a Medicare patient fees in addition to those received from the government. Such procedure is strictly contrary to the contract under which the Medicare program operates. The practicing physician is not obligated to accept a Medicare patient, but if he submits a bill to Medicare he must also check A or B under

Item 29 of Claim Form 1863 and must list the true situation under Item 26. For the exceptions listed above, that item may show \$15 for other than hospitalized care in obstetrics or accidents. The government, however, considers Medicare to be a full coverage program within the limits of the conditions that are covered and guarantees to its patients that there will be no additional medical charge.

A considerable number of claims, 70 to be exact, have been delayed in processing. Those were the claims that could not immediately be justified by the fee schedule, and they were submitted to the Medicare Committee. This committee has met three times for all-day sessions considering the claims that have been submitted. Some have had to be rejected because they could not qualify under Medicare. In those instances the patient becomes responsible for payment of the bill. In others, the claim was still further delayed because it had to be sent to Washington for a ruling. In still others, the amount of charges was reduced by the committee because, for one reason or another, the physician's fee and that in the established fee schedule did not agree. Those three categories will reduce in number as rapidly as physicians become acquainted with the program.

There is one other category in which claims always will be delayed, and that is where unusual care is required for circumstances not covered in the fee schedule. Those situations are covered by individual consideration, and each claim, after reaching the Blue Shield office, is sent to the Medicare Committee and then to Washington before it may be processed.

It is the hope of the committee that Kansas doctors will continue to cooperate with the plan, and there have been very few problems of any importance whatever with reference to this program.

Twenty Questions

Editor's Note. Reproduced below is a column written by Peter Edson, NEA Staff Writer, on May 31. It is being printed here with permission of NEA Service, Inc.

Retiring Treasury Secretary George M. Humphrey has devised a new game of "20 Questions" to find out if there is anybody around who is a real, true advocate of government economy.

This game can be played any place you get a group of people together—at a woman's club, a chamber of commerce, any knife-and-fork club luncheon gathering, in a labor union or farm organization meeting, or at a cocktail party.

The rules are simple. Let the chairman ask all those present to stand. The chairman then proceeds to read off the 20 questions given below. Telling the

truth and nothing but the truth, every person who answers an honest, "Yes!" to any of the questions must sit down. Such person is counted out as not being a true believer in government economy.

STANDEE IS "IT."

Then repeat this process for every question in the list. If there is anyone still on his or her feet at the end, that person is "it"—a real devotee of decreased government spending.

All set? Here's the first question:

1. Have you ever opposed raising U. S. postage rates so as to make the U. S. Post Office Department self-supporting?

If you answer, "Yes!" sit down. You're out. Next:

2. Have you supported programs for greater federal expenditures in your community for housing or slum clearance?

3. Have you ever wanted the government to do a free dredging or flood control project on some nearby waterway?

4. Have you ever wanted Congress to pass a "pork barrel" appropriation for some dam or reclamation project?

DORM FOR YOUR COLLEGE?

5. Have you ever wanted the government to help build a new dormitory for your favorite college?

6. Have you favored more federal funds for community development, such as sewage disposal or water supply projects?

7. Have you favored federal ship building subsidies for the maintenance of an American flag merchant marine?

8. Have you favored high, rigid price support subsidies on American farm products?

9. Have you wanted the government to continue subsidizing uneconomic mining operations by guaranteed rates of payment?

10. Have you ever advocated greater expenditures for a long list of "welfare" activities—including school lunches, medical research, aid to education and so forth?

11. Have you ever been associated with groups seeking Hill-Burton act funds for a new hospital in your area?

EVER PROTEST?

12. Have you ever protested when the Army, Navy, Air Force or Veterans Administration proposed closing or consolidating a government hospital in your area, for reasons of economy?

13. Have you ever indorsed increasing pensions or hospitalization benefits for veterans whose disabilities are NOT connected with military service?

14. Have you ever wanted the government to provide your community with a new airport?

15. Has any company with which you are connected ever received any benefits from accelerated tax amortization allowances?

16. Have you ever protested when the government proposed closing up some military installation or ending some business-type activity which would have taken a government payroll out of your community?

17. Have you supported greater federal appropriations for Rural Electrification Administration, Tennessee Valley Authority or any other public power projects?

GRANTS-IN-AID?

18. Have you favored federal grants-in-aid to the states for highway construction, drought relief, disaster loans, aid to depressed areas, public assistance for combating juvenile delinquency?

19. Have you ever urged greater federal expenditures for recreational facilities in the national parks, national forests or for the fish and wildlife service?

20. Have you ever written your Congressman to help you get a job, a government contract or for tax relief or some other special favor that would cost Uncle Sam some money?

Anybody still standing, who answered, "No!" to all those questions? If so, give him the prize.

World Medical Association

A resolution approving the World Medical Association was passed by the House of Delegates of the American Medical Association at its June meeting in New York City. Membership fee in the international organization is \$10 per year, which includes a subscription to the quarterly publication, *World Medical Association Journal*. Dues may be paid to World Medical Association, 10 Columbus Circle, New York 19, New York. The A.M.A. resolution follows:

Whereas, The World Medical Association is the only international medical organization representing the practicing profession in the fields of medical economics and medical education and devoted to protection of the freedom of the practice of medicine; and

Whereas, The United States Committee of W.M.A. was organized in 1948 to enable all American physicians to render support to the objectives of The World Medical Association and help improve the status of organized medicine internationally; and

Whereas, After nine years only 5,000 U. S. physicians have become members of the U. S. Committee,

although both the Association and the Committee are engaged in projects of vital interest to every American physician; and

Whereas, The House of Delegates of the A.M.A. at its Clinical Session in November 1956 declared: "It is difficult . . . to believe that any physician in the United States . . . is not a member of the (U. S. Committee) W.M.A. . . . Further expansion of the U. S. Committee will be necessary if the American viewpoint is to be continually and effectively presented by our spokesmen in The World Medical Association and, through them before other international bodies, to protect the interest and aims of medicine. . . . Surely physicians will wish to share in this international effort"; therefore be it

Resolved, That the House of Delegates of the American Medical Association reiterate its support of The World Medical Association and recommend that every member of the American Medical Association join the U. S. Committee of The World Medical Association; and be it further

Resolved, That the component state associations be urged to support and give official recognition to the state chairmen and subcommittees of the U. S. Committee in order to achieve the objectives of The World Medical Association in protecting the freedom of medical practice and increasing the influence of the practicing medical profession at the international level.

Medical Meeting at Norton

All members of the Kansas Medical Society are invited to attend a scientific and social meeting to be held at the State Sanatorium for Tuberculosis at Norton the afternoon and evening of October 6, under sponsorship of the sanatorium and the Northwest Kansas Medical Society. The program will begin at two o'clock.

Two speakers will discuss histoplasmosis and show slides, Lt. Col. Richard R. Taylor, chief of research and development, Fitzsimons Army Hospital, Denver, and Dr. L. M. Furcolow, medical director, U. S. Public Health Service, Kansas City. After an intermission Dr. Roger Mitchell, director of the Colorado Foundation for Research in Tuberculosis, Denver, will speak on "Emphysema as an Ever Increasing Clinical Problem," and Dr. John L. Morgan, Emporia, will discuss "Clinical Aspects of Chronic Cor Pulmonale."

A social hour at the home of Dr. C. F. Taylor, superintendent of the sanatorium, will be followed by a banquet at the Lathrop Building. The evening event will be a "Stump the Expert" program with

case histories presented by those attending. Wives of physicians who attend the meeting will be entertained at the Taylor home. Advance reservations are suggested.

Clinical Conference in Oklahoma City

The Oklahoma City Clinical Society will open its 27th annual three-day conference at the Biltmore Hotel, October 28. Lectures and discussions will be presented by 15 guest speakers from medical and teaching centers throughout the nation. There will also be specialty lectures, a clinicopathological conference, and daily luncheon roundtable question and answer sessions.

Social events will include a banquet on Monday evening with Kenneth McFarland, Ph.D., Topeka, as speaker, specialty group dinners on Tuesday evening, and a dinner dance on Wednesday evening.

The conference has been approved for credit by the American Academy of General Practice. All physicians who are members of their county societies are invited.

Board Elects Officers

William P. Callahan, M.D., Wichita, was named president of the new Kansas Healing Arts Board at a meeting in Kansas City on August 6. Another member of the Kansas Medical Society, Francis J. Nash, M.D., Kansas City, was chosen to serve as secretary. Richard Gibson, D.O., Winfield, was elected vice-president. The board is made up of five doctors of medicine, three osteopaths, and three chiropractors.

Symposium on Asian Influenza

A feature of the conference of the Kansas City Southwest Clinical Society, to be held in Kansas City, September 30 through October 3, will be a symposium on Asian influenza at a luncheon session on the opening day. Four speakers will present papers, after which there will be a question and answer period.

The program will include: "Origin and Spread of Asian Influenza," Dr. William H. Stewart, United States Public Health Service, Washington; "Status of Vaccine Research and Immunological Problems," Dr. Tom D. Y. Chin, Public Health Service Communicable Disease Station, University of Kansas Medical Center; "Organizational and Mobilization Plans in Case of an Epidemic," Dr. H. M. Hardwicke, Jefferson City, and "Treatment of Asian Influenza and Management of Complications," Dr. Harold C. Lueth, chairman of A.M.A. committee to combat Asian influenza, Chicago.

Clinicopathological Conference

Pulmonary Lesions, Hypercholesterolemia, Hepatomegaly, Jaundice and Coma in a Young Man

Case Presentation

We are concerned today with a 20-year-old Negro man who entered the University of Kansas Medical Center for the third time on September 13, 1956, and who died on September 15, 1956.

He was first admitted to this hospital on June 16, 1956. He had felt well until April, 1956, when he first noted a feeling of fullness in his abdomen after meals. Since that time he had lost 25 pounds and had noticed a mass (which was more marked postprandially) in the right lower quadrant of the abdomen. He had had no melena, hemoptysis, hematemesis, diarrhea, acholic stools, dark urine, fatty food intolerance, fever, chills, cough, perspiration, or shortness of breath.

In May, 1956, his physician told him that he had an enlarged liver and "spots" on his lung.

His past history and system review were non-contributory. Both parents and two siblings were living and well.

The patient was a thin, chronically ill, colored man who appeared to be in no acute distress and who was alert and cooperative. His blood pressure was 170/130; the pulse rate 104; respiratory rate, 24; temperature, 100. Examination of the optic fundi revealed numerous areas of white edema residues about the discs, particularly in the macular area. There were also numerous areas of superficial flame-shaped hemorrhage and arteriovenous crossing defects. The tongue was red and coated. There was no cervical adenopathy. The chest was clear to percussion and auscultation. The heart was not enlarged; the second aortic sound was greater than the second pulmonic sound. One observer described a pleuro-pericardial friction rub over the precordium which was obliterated by inspiration, and another described a grade III precordial systolic murmur. The liver was extremely large and nodular and extended to the iliac crest. The spleen was palpable 4 cm. below the left costal margin. There was no fluid wave and no adenopathy. The remainder of the examination was within normal limits.

The specific gravity of the urine was 1.012 with

a faint trace of albumin and 2 to 4 pus cells per high power field. The red count on admission was 4,950,000 with 15.3 gm. hemoglobin; the white count was 4,700 with 70 per cent polymorphonuclears, 19 per cent lymphocytes, 1 per cent eosinophils, 2 per cent basophils and 8 per cent monocytes. Subsequent blood counts showed a gradual drop of the hemoglobin to 9.3 gm. with 3,340,000 red blood cells at the time of discharge on July 9, 1956, but the white count was essentially unchanged. The platelet count remained approximately 500,000 throughout his hospitalization. The VDRL was non-reactive.

The serum calcium was 5.9 mEq/L; phosphate, 1.3 mEq; sodium, 139 mEq; potassium, 4.6 mEq; carbon dioxide, 30.6 mEq; chlorides, 94 mEq. The blood sugar was 68 mg. per cent; the serum cholesterol was 1,034 mg. per cent with 52 per cent esters; the blood urea nitrogen was 8.0 mg. per cent on admission and 20.5 mg. per cent on discharge. The serum iron was 78 gamma per cent; prothrombin time, 75 per cent of normal; bleeding time, 1.5 minutes; clotting time, 22 minutes. The urine 17 ketosteroids was 2.5 mg. per 24-hour period. The urinary catecholamines were not increased, and a phentolamine (regitine) test was negative. The blood ammonia was 143 gamma per cent; serum transaminase, 172 GOT units. The blood sedimentation rate was 17 mm. in one hour. Numerous target cells were seen on peripheral blood smear. A hepatogram revealed a direct serum bilirubin of .4 mg. per cent with a total bilirubin of 2.7 mg. per cent; alkaline phosphatase, 6.5 millimoles; cephalin cholesterol, negative; thymol turbidity, 5 units; serum albumin, 5.36 gm. per cent; and serum globulin, 2.89 gm. per cent. Cytologic examinations of the urine revealed numerous clumps of malignant cells (class V) on two occasions.

During the first hospitalization his blood pressure ranged from 160/100 to 190/120. A liver biopsy was done on June 25, 1956. He had several episodes of epistaxis. A trial course of x-ray therapy to the abdomen was given before his discharge, and, as an outpatient, he received a total of 400 roentgens depth dose through the anterior and posterior abdominal portals. He was dismissed, to be followed in the outpatient clinic, on July 9, 1956.

On August 22, 1956, he had a hemorrhage in the

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

left lower gingival area which continued until the day of his second admission on August 25.

The patient was quiet, depressed, and expectorating moderate amounts of bloody mucous material. His blood pressure was 120/80; pulse, 120; respiration, 18; temperature, 98.6 degrees. There was radiation pigmentation over the skin of the abdomen. Small pustules were seen on the mid-chest and on the right side of the nose. There was no peripheral adenopathy. The fundoscopic examination revealed narrow arterioles and many exudates. The chest was clear to percussion and auscultation. The liver was firm and palpable below the right iliac crest. There was bleeding between the second and third left lower molars.

The urinalysis revealed a specific gravity of 1.020 with negative albumin and sugar. There were rare pus casts, red cells, and leukocytes. The red count was 3,080,000 with 9.3 gm. of hemoglobin; the white count was 3,400 with 59 per cent polymorphonuclears, 15 per cent lymphocytes, 1 per cent eosinophils, 1 per cent basophils, and 22 per cent monocytes. An occasional atypical lymphocyte was seen. There was moderate anisocytosis and macrocytosis with slight to moderate poikilocytes and fragmentation of the red blood cells. There was considerable variation in color of the erythrocytes. The platelet count was 176,000 per cubic millimeter. The hematocrit was 29.5 ml. per 100 ml. of blood. The mean corpuscular volume was 96 cu. microns; the mean corpuscular hemoglobin, 29.2 micrograms; mean corpuscular hemoglobin concentration, 31.2 per cent. The bleeding time was one minute; coagulation time, 20.5 minutes; clot retraction was complete in 45 minutes. The prothrombin time was 70 per cent of normal. There was no lysis of the incubated clot.

Attempts were made to stop the bleeding with local pressure, Gelfoam packs, epinephrine packs, astringent mouthwash, intravenous conjugated estrogenic substances (Premarin), intramuscular Adrenosem, intravenous and intramuscular koagamin, and intramuscular posterior pituitary extract. All of these methods failed. The patient was given 500 ml. of whole blood on August 25, and on the morning of August 26 the bleeding stopped spontaneously, but he was given an additional 500 ml. of whole blood at this time. He was discharged on August 29 with a red count of 3,110,000 and 9.9 gm. of hemoglobin. There was no bleeding at that time.

Following his dismissal his condition became steadily worse and was marked by progressive lethargy, anorexia, jaundice, and incontinence of urine and feces. He was admitted for the third time on September 13, a thin, jaundiced, stuporous, terminally ill man. The blood pressure was 130/80; the

pulse was 90 and regular; respiration, 24. The skin was jaundiced and appeared dehydrated. There was no adenopathy. The neck was supple. The fundi showed numerous exudates, and the sclerae were icteric. There was dullness to percussion in the right base with bronchial breath sounds heard over that area. The second aortic sound was greater than the second pulmonic sound. There was a grade II blowing systolic murmur at the pulmonic area which was transmitted over the precordium. The radiation pigmentation was still present over his abdomen. The liver was hard, nodular, and palpable below the iliac crest. The spleen and kidneys were not palpable. The peripheral pulses were good bilaterally. There was a coarse tremor of the hands, otherwise the neurological examination was normal with the exception of the deep stupor.

The urine had a specific gravity of 1.014 with 1 plus albumin, negative sugar, and positive hematest. It was loaded with motile bacteria and contained 8 to 10 pus cells per high power field. The red blood count was 2,300,000 with 7.5 gm. hemoglobin; the white count was 12,640 with 77 per cent polymorphonuclears, 65 per cent filamented, 12 per cent non-filamented, 18 per cent lymphocytes, 3 per cent eosinophils, and 3 per cent metamyelocytes. There were 17 nucleated red blood cells per 100 white blood cells. The non-protein nitrogen was 59.5 mg. per cent; blood urea nitrogen, 37 mg. per cent; blood sugar, 107 mg. per cent; serum sodium, 138 mEq/L; potassium, 4.4 mEq; carbon dioxide, 14.2 mEq; chlorides, 96 mEq; blood ammonia, 297 gamma per cent; transaminase, 11 GOT units per milliliter. A hepatogram revealed alkaline phosphatase 5.1 millimol units; direct serum bilirubin, 20.6 mg. per cent; total bilirubin, 32.5 mg. per cent; cephalin cholesterol, 1 plus; thymol turbidity, 24 units; serum albumin, 3.41 gm. per cent; serum globulin, 2.69 gm. per cent; serum cholesterol, 472 mg. per cent with 12 per cent esters.

The patient was admitted primarily for terminal care. Medication consisted of intravenous fluids for dehydration and sponge baths to reduce his fever. On September 14 he was given 40 gm. of monosodium glutamate, but there was no increase in his responsiveness. He also received intravenous tetracycline and corticotropin, and oxygen by nasal catheter. He became progressively worse, and his blood pressure, terminally, was 100/60 with a pulse rate of 94. He was afebrile at the time of death, and he died quietly.

Dr. Mahlon Delp (moderator): Are there any questions of Dr. Dunn?

Edward L. Johnson (fourth year medical stu-

dent)*: Was there any previous history of jaundice?

Dr. Marvin Dunn (resident in medicine): No.

Mr. Johnson: Was there a history of poor dietary habits or alcohol?

Dr. Dunn: He had a normal dietary history, and there was no history of alcoholism.

William Harrin (fourth year medical student): Were there any skin lesions on the parents or siblings?

Dr. Dunn: No.

Richard E. Heikes (fourth year medical student): Could you describe the liver more fully?

Dr. Dunn: The liver was firm, massive, and nodular.

Alexander Krantz (fourth year medical student): Were the testicles descended, and were they atrophied?

Dr. Dunn: The testicles were descended, and no atrophy was found.

Otis O. Moseley (fourth year medical student): What was the urinary output in the hospital?

Dr. Dunn: It was low during his last admission.

Mr. Krantz: What was the result of the liver biopsy?

Dr. Dunn: The cells showed undifferentiated malignancy.

Mr. Johnson: What were the results of the trial course of x-ray?

Dr. Dunn: The liver became somewhat smaller.

Mr. Moseley: Were lipid determinations done?

Dr. Dunn: No.

Mr. Heikes: Had he had any moles?

Dr. Dunn: No.

Mr. Harrin: Was his urine dark during any of his hospitalizations?

Dr. Dunn: No.

Mr. Moseley: Was there any history of hypertension?

Dr. Dunn: No.

Mr. Johnson: Were the femoral pulses palpated?

Dr. Dunn: Yes, they were equal bilaterally.

Mr. Krantz: Was there previous history of a heart murmur?

Dr. Dunn: No.

Mr. Moseley: Was there any occult blood in the stools?

Dr. Dunn: No.

Mr. Johnson: Was a Coomb's test done on the first admission?

Dr. Dunn: No.

Mr. Harrin: Were bilirubins done on his second admission, and was he clinically jaundiced?

Dr. Dunn: He was not jaundiced and no bilirubin determinations were done.

Dr. Delp: We will now see the electrocardiograms.

Mr. Harrin: The electrocardiogram made on June 18, 1956, shows some decreased voltage in the chest leads (Figure 1). I interpret this tracing as a left axis deviation compatible with left heart hypertrophy.

Dr. Delp: Do you have any comment, Dr. Lin?

Dr. T. K. Lin (cardiologist): I would not make the diagnosis of left heart hypertrophy from this tracing.

* Though a medical student in May, 1957, when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1957.

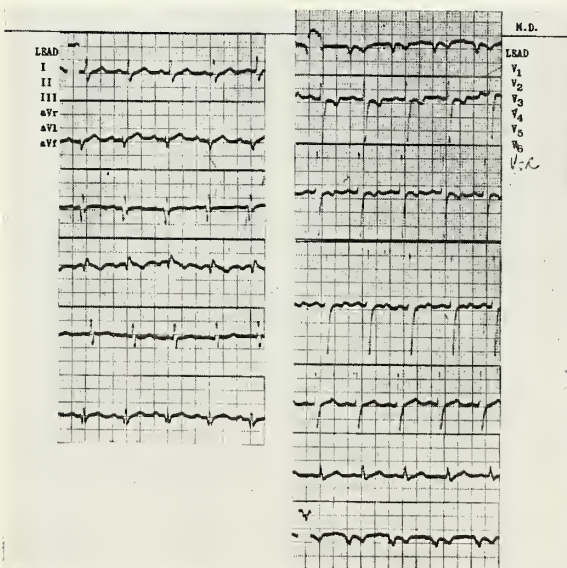


Figure 1. Electrocardiogram made on first admission.

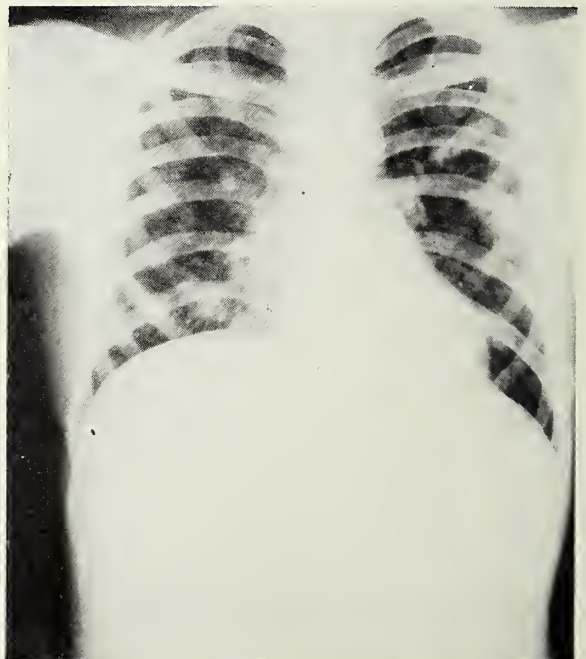


Figure 2. Chest x-ray taken during first admission.

Dr. Delp: May we have x-rays, please.

Doris M. Kells (fourth year medical student): The chest x-ray taken during the first admission shows circumscribed patches of soft tissue infiltration throughout all lung fields (Figure 2). There are no bony abnormalities, and the costophrenic angles are clear. The heart is not remarkable. The right diaphragm is elevated. This film is compatible with metastatic lesions of the lungs and with hepatomegaly.

No bony abnormalities are seen on the kidney-ureter-bladder film, but there is diffuse haziness extending down from the diaphragm to close to the iliac crest. I interpret this as being a massive liver.

The intravenous pyelogram shows good concentration of the dye bilaterally. There are no abnormalities of the calyces, pelvis, or ureters, and the bladder is smooth. The left kidney is lower than the right, a reversal of the usual position.

The upper gastrointestinal films show a diffuse haziness on the right, with displacement of the stomach and small bowel to the left. There is no evidence of intrinsic disease of the stomach or intestine. The lower gastrointestinal film shows that the colon is displaced downward with no intrinsic abnormalities noted.

The film of the lung, taken on the last admission, shows greater soft tissue infiltration and greater elevation of the right diaphragm than the previous chest film (Figure 3). The degree of soft tissue infiltration makes it impossible to evaluate the costo-

phrenic angles. The heart is not remarkable. I consider this film consistent with growth of the metastatic lesions and a greater enlargement of the liver in comparison with the previous x-ray.

In summary, I interpret this series of x-ray films as being compatible with metastatic involvement of the lungs and with hepatomegaly. It should be noted that no primary malignant sites other than the liver have been demonstrated in these films.

Dr. Delp: Thank you. We will now have the differential diagnosis.

Differential Diagnosis

Mr. Heikes: Although a malignant tumor is rather unusual in this age group, the diagnosis of some type of malignancy seems obvious from a brief summary of the case. There was a 25-pound weight loss in two months and a history of consulting another physician who told him he had a large liver and "spots" on the lung. Physical findings revealed an emaciated male with a huge, firm, nodular liver. The x-rays showed metastases in the lungs. Cytologic studies of the urine showed grade V cells on two occasions. There was a progressive decrease in hemoglobin, and the hepatogram was consistent with neoplastic disease of the liver, especially the elevated transaminase and blood ammonia. In the hospital the patient rapidly became worse, and he died in three months. The terminal liver function tests indicated severe liver damage, and he developed a tremor, became stuporous, and, finally, comatose before death.

I will first consider primary tumors of the liver. Approximately one per cent of malignancies coming to autopsy are primary carcinoma of the liver. This disease is most common in the sixth decade with a small peak of incidence in the first two years of life. Most patients with carcinoma of the liver have some definite predisposing factor, and it is important to consider whether this patient did. In hemochromatosis 10 per cent of the cases develop carcinoma of the liver, but we have no evidence of diabetes, increased pigmentation of the skin, heart failure, or elevated serum iron in this patient. Parasitic infections of the liver also predispose to primary carcinoma, but there is no evidence for such an infection. In this country cirrhosis is a most important predisposing factor. Three to four per cent of cirrhotic patients develop primary carcinoma of the liver as compared with 0.05 per cent of non-cirrhotic patients.

There are two types of primary carcinoma of the liver. About 80 per cent are hepatoma, and 90 per cent of these are superimposed on a pre-existing cirrhosis. The remaining 20 per cent are cholangioma, and only 50 per cent of these cases have pre-existing cirrhosis.



Figure 3. X-ray of lung taken during last admission.

In this patient I can rule out portal cirrhosis because there is no history of alcoholism, nutritional deficiency, dark urine, clay-colored stools, or ascites; and the laboratory findings are not compatible with that disease.

There are two types of biliary cirrhosis. For the primary type we need a history of malaise of long duration, pruritus, early jaundice, large liver, xanthomata, and attacks of pain simulating cholecystitis. This disease is more common in women. Laboratory findings of low thymol turbidity, negative cephalin cholesterol, extremely high cholesterol, and elevated bilirubin are all consistent with this disease, but one would expect a higher alkaline phosphatase. I cannot rule out this diagnosis, but I consider it unlikely.

The secondary type can be dismissed quickly because there is no evidence of extra-hepatic obstruction. The fact that no good evidence for any predisposing factor can be found militates against the diagnosis of a primary tumor of the liver; furthermore, patients with primary carcinoma of the liver commonly have a strongly positive cephalin cholesterol, whereas patients with metastatic disease of the liver do not.

I will, therefore, now consider some neoplasms that metastasize to the liver and might produce some of the findings present in this protocol. Pheochromocytoma is most common in young and middle-aged groups. Eight per cent of these tumors are malignant, but the metastases are not massive. I can rule out this tumor on the basis of negative phentolamine and catecholamine tests.

Discussion of carcinoid tumor has been popular in many medical journals recently. In its metastatic form it is a rare tumor, but it does occur at any age. It is usually slow growing, but at times it may become quite malignant and produce a large liver. Flushing, cyanosis, diarrhea, abdominal cramps, and wheezing are usually present when it involves the liver. A pulmonic systolic murmur and elevated blood pressure may accompany these symptoms.

Renal cell carcinoma usually occurs in persons over 50 years of age, and it is rare under the age of 30. It predominates in males over females in a 3:1 ratio. It is not unusual for a small primary tumor to give rise to multiple and massive metastases, but a number of cases have been reported in which metastases caused a large liver, some being over 5,000 gm. Of the fatal cases, three-fourths metastasize to the lung and one-fourth to the liver. The grade V cells in the urine sediment favor this diagnosis, but there was not the degree of hematuria which one expects in about 80 per cent of all renal cell carcinomas.

The last type of tumor I shall consider is the malignant melanoma. This, too, is a rare tumor having only a 0.7 per cent incidence in one series of 1,200

cancer autopsies. It occurs at any age, but three-fourths of the cases occur between 30 and 70 years of age. This neoplasm frequently has a bizarre behavior. Multiple and massive metastases can arise from a benign looking mole, and at times no primary site is demonstrable. Primary tumors are found in tissues other than the skin, the ciliary body and choroid of the eye being rather common sites. They may also be found in the mucous membrane and the adrenal cortex. Of the various metastatic lesions that cause huge livers, this tumor is the most frequent offender.

In summary, I believe pheochromocytoma and carcinoid tumors can be ruled out. Primary liver carcinoma and renal cell carcinoma are good possibilities, but I think malignant melanoma is the best diagnosis. I suspect that the primary site was in the eye (as that is the most frequent site for a hidden primary), or that no primary could be found. This patient had massive liver metastases which caused severe liver failure, as evidenced by the abnormal liver function tests, jaundice, stupor, tremor, coma, and finally death.

Clinical Discussion

Dr. Delp: What is your diagnosis, Mr. Krantz?

Mr. Krantz: Renal cell carcinoma.

Dr. Delp: Mr. Johnson?

Mr. Johnson: Renal cell carcinoma.

Dr. Delp: Miss Kells?

Miss Kells: Malignant melanoma, but I cannot rule out a hepatoma.

Dr. Delp: Mr. Moseley?

Mr. Moseley: Primary tumor of the liver.

Mr. Harrin: Renal cell carcinoma.

Dr. Delp: You mentioned some of the factors predisposing to primary carcinoma of the liver, one of which was cirrhosis. What kind of a cirrhosis do you think this man might have had?

Mr. Krantz: Probably primary biliary cirrhosis because of the markedly elevated cholesterol, but I would expect to see a much higher alkaline phosphatase.

Dr. Delp: You do not think he had Laennec's cirrhosis?

Mr. Krantz: No, sir.

Dr. Delp: Why do you dispose of Laennec's cirrhosis?

Mr. Krantz: Primarily because of his age and history of good dietary intake. There is no history of alcoholism.

Dr. Delp: Mr. Heikes, you disposed of Laennec's cirrhosis; what did you substitute?

Mr. Heikes: Biliary cirrhosis.

Dr. Delp: Mr. Krantz, how did you explain the

elevated blood cholesterol? On the basis of biliary cirrhosis?

Mr. Krantz: Tannhauser³ lists two major groups with increased serum cholesterol. These can be differentiated by whether the patient has a clear or chylous serum. This patient had a clear serum, and we can divide the causes of hypercholesterolemia with a clear serum into three groups: familial xanthomatous hypercholesterolemia, xanthomatous biliary cirrhosis, or hypothyroidism. Hypothyroidism can quickly be ruled out in this case. I think xanthomatous biliary cirrhosis is the best diagnosis on the basis of the material presented to us. Xanthomatous biliary cirrhosis is a primary liver disease with inflammation of the small cholangioles which subsequently close up, and cause a reflux of cholesterol, bilirubin, and alkaline phosphatase. In addition, the liver apparently has an increased secretion of cholesterol in this disease which contributes to the remarkably elevated cholesterol. At times the bilirubin is quite low and the cholesterol is quite high, which is difficult to explain. It is essentially a benign disease, and patients usually live for a long time. I believe the patient had this disease, and that it rapidly degenerated into a malignant hepatoma.

Dr. Delp: Mr. Johnson, the patient came in with a blood pressure of 170/130. How do you explain the hypertension?

Mr. Johnson: I explain that on the basis of renal ischemia. According to Goldblatt there can be pressure on the renal parenchyma and on the renal artery from an enlarged liver; there can also be metastases into the lymph nodes occluding the renal arteries, and this in turn causes the abnormal kidney which is postulated to release renin which, when activated in the plasma, produces angiotonin, the agent responsible for the hypertension.

Dr. Delp: How do you explain the class V cells in the urine if this patient had a malignant melanoma?

Mr. Johnson: In Virchow's Archives of 1873 there is a report of a case of malignant melanoma with widespread metastases in which microscopic sections of the kidney showed a diffuse spread of malignant cells in the glomeruli and tubules.

Dr. Delp: Miss Kells, what is your explanation for the murmur?

Miss Kells: It may have been due to pulmonary stenosis. I assume that the murmur was heard before he had his profound anemia; therefore, I cannot explain this on the basis of anemia. Because it was recorded as being heard in the pulmonic area on the third admission, I believe it may have been due to pulmonic stenosis and congenital heart disease. I have no other explanation for it.

Dr. Delp: Now, a few comments from Dr. Berry.

Dr. Maxwell G. Berry (internist): It seems to me that there are a lot of incompatibilities which are difficult to tie together. The first is the age of the patient with a very malignant tumor; the second, an exceedingly high blood pressure; third, the hypercholesterolemia; fourth, the fact that he had an enlarged spleen when he came in here; and fifth, the nodular pulmonary metastases. It is difficult to account for all of these with one diagnosis.

As usual, I have to agree with the students and their original diagnosis of malignant melanoma, but it seems to me that we must assume that this man had obstruction to his biliary tract and to the venous return from the spleen, as well as some interference with renal circulation. I am not sure that I have ever seen obstruction of the renal vein cause hypertension. Malignant melanoma is one of the diagnoses that I made in reading over this protocol. I am hesitant to dismiss completely the diagnosis of some form of lymphoma because of the tendency to hemorrhage in this age group. Although nodules in the lung are rare in cases of this type, I still think that it is a possibility.

Dr. Delp: What is your explanation for the elevated cholesterol, Dr. Manning?

Dr. Robert Manning (resident in medicine): I think that it can best be explained on the basis of primary familial hypercholesterolemia or primary biliary cirrhosis.

Dr. Delp: Dr. Lin, would you venture an opinion on the murmurs that were described?

Dr. Lin: In the first place, one observer described a murmur while another observer heard a friction rub, both on the first admission. There was no murmur during the second admission, so I would assume that the first one must have been a friction rub. I doubt that the patient had congenital heart disease. The terminal murmur was probably due to anemia.

Dr. Delp: Do you think that the murmur could have been the hum heard over a cirrhotic liver?

Dr. Lin: That is a possibility, but it was quite high, being heard in the pulmonary area.

Dr. Delp: Dr. Kaul, what is your diagnosis?

Dr. Philip G. Kaul (internist): I think that this patient had primary biliary carcinoma superimposed on biliary cirrhosis.

Dr. Delp: Dr. Allbritten, do you have a diagnosis?

Dr. Frank F. Allbritten (surgeon): Primary carcinoma of the liver.

Dr. Delp: Dr. Bly, may we have your report?

Pathological Report

Dr. Chauncey G. Bly (pathologist): We too had trouble making only one major diagnosis, as you will

see. The patient was moderately jaundiced and severely emaciated; he weighed about 100 pounds, and he was six feet tall.

The liver, weighing 4600 gm., was filled with nodular tumor masses. So thoroughly distorted was the architecture that it was difficult to recognize grossly any remaining normal liver parenchyma. As is characteristic of many primary liver tumors, there was invasion of the main portal vein and its smaller branches; there was also invasion of the hepatic vein tributaries.

Microscopically, patches of many recognizable but distorted liver lobules showing both central veins and portal areas were seen between tumor nodules. These, together with other irregularly distributed, wide, multilobular bands of collapsed and increased fibrous tissue with few inflammatory cells, suggested that the liver represented post-collapse fibrosis or "post-necrotic cirrhosis" rather than biliary or pericholangiolitic cirrhosis remotely antedating the tumor. We would have been happier about this diagnosis of "post-necrotic cirrhosis" if there had been a previously known clinical episode of viral or chemical hepatitis. Moreover, some of the observed peri-lobular inflammation and the nodular regeneration of liver tissue were changes compatible with the regional "pericholangiolitic biliary cirrhosis" expected to follow local biliary obstruction and widespread destruction of liver tissue by tumor.

The small needle biopsy specimen taken three months before death was so completely filled with tumor that the state of the liver parenchyma and the amount of fibrous tissue present at that time could not be reliably estimated. We cannot, therefore, state incontrovertibly that this patient did have cirrhosis before the hepatoma began, but we believe that he did. Although at one time antecedent cirrhosis was felt to be a necessary precursor to hepatoma, many investigators in the last few years have reported increasing numbers of cases in which cirrhosis has not been present.^{2, 4, 5} This has been particularly true of the parenchymal cell hepatocarcinoma occurring in children and young adults.

On the other hand, Higginson, among others, seems to feel that in the African Negro hepatitis and/or post-collapse (-necrotic) cirrhosis may be of particular premalignant significance by somehow sensitizing or predisposing to hepatocarcinogenesis.²

The many focal small areas of fatty change present in this liver were not unexpected, since the patient had progressive ischemia of the surviving liver tissues, resulting from gradual compression of parenchyma and blood vessels by tumor masses and thrombi. Moreover, he had generalized malnutrition. In-spissated bile plugs were seen in interlobular and

larger bile ducts, canals of Hering, and peripheral intro-lobular canaliculi, most prominent near obstructing tumor nodules.

Microscopically, the tumor had an organoid appearance with discrete clumps of cells, sometimes appearing as columnar cells lined up around a central space, simulating acinar structures. This also appeared in the needle biopsy tissue three months before death, and had suggested carcinoid or paraganglionoma as primary tumor possibilities at that time. Numerous mitoses were seen in the proliferating tumor cells. Many of the tumor areas closely resembled parenchymal liver itself, even showing abortive canaliculi filled with inspissated bile.

Peculiar tumor giant cells, sometimes with multiple large nuclei, characteristic of hepatocellular carcinomas, were numerous in several areas. In addition to nodular masses of tumor invading sinusoids and compressing parenchyma, cords of tumor cells were seen invading walls and lumens of vessels and lymphatics, sometimes appearing to float as free tumor emboli (Figure 4). Because of this proclivity to enter and spread through vascular channels, some investigators feel that hepatomas spread almost simultaneously in all directions from the primary site, to explain the massive involvement often seen in the liver at death. It is true that localized solitary primary liver tumors are occasionally seen at autopsy or surgery, some of them apparently resectable. On the



Figure 4. Low power view of liver. Large vessel at upper left is filled with tumor mass extending from tributary to the right. Dense collapsed connective tissue separates and extends into liver lobules in lower right part of field.

other hand, in experimental animal liver tumors and in most human liver tumors, the multicentric origin of the tumors or multiple primaries, with similar or dissimilar microscopic appearance, is more generally accepted.

Over the diaphragmatic surface of the liver were fibrinous peritonitis, organizing fibrous adhesions, and some acute hemorrhagic necrosis in the liver as well as the long-standing atrophy of gradual or partial ischemia. These were again due to the tumor throughout the liver, rather than to the previous small course of irradiation.

As expected from the observed tumor invasion and embolization of hepatic vein tributaries, the lungs were studded with tumor metastases, 2 to 50 mm. in diameter. Some of these were brownish-yellow throughout, resembling liver nodules. Others were greenish-yellow or white, depending on their degree of differentiation and bile production. Many of the hilar lymph nodes were also filled with tumor nodules. Abortive canaliculi filled with inspissated bile plugs were seen microscopically in many of these metastatic nodules (Figure 5).

In many areas of the brain there were numerous enlarged, pale astrocytes which were almost pathognomonic of hepatic coma and were associated with this patient's increasing blood ammonia.

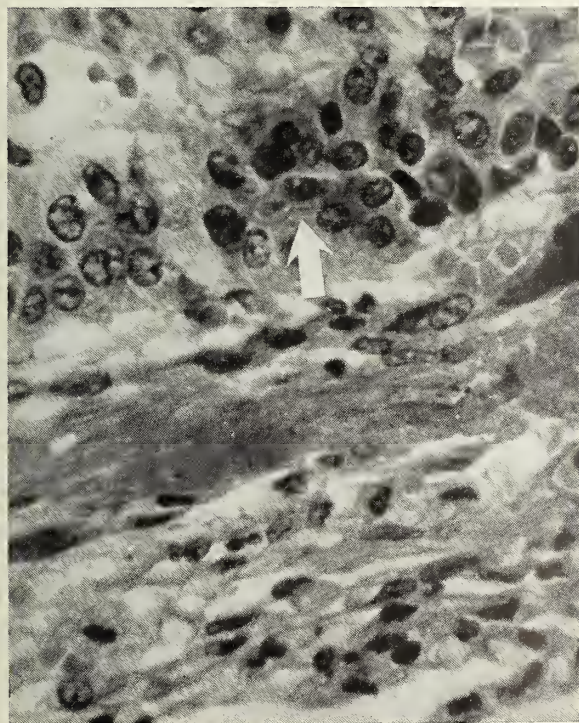


Figure 5. High power view of lung showing mass of liver tumor cells in upper half of field. The arrow points to a well-formed but abortive bile canaliculus filled with bile plugs.

The other main group of findings relate to this patient's severe hypercholesterolemia. He did not have extrahepatic biliary obstructions, skin or tendon lesions, or familial history. Nor do we have enough data to classify this finding except to call it "idiopathic hypercholesterolemia."¹ Grossly this seemed to be manifested by severe arterial atheromatosis, a greatly enlarged soapy-appearing spleen, weighing 500 gm., and peculiar, small, pale green foci in the bone marrow. Microscopically, large zones of pale, swollen, foamy cells were seen throughout the spleen, particularly beneath the capsule, surrounding central arterioles and around the trabeculae (Figure 6). Many foci were also seen in the bone marrow, liver, lung, lymph nodes, and pancreas. By the use of various stains and the polarizing microscope it was demonstrated that these cells contained not only cholesterol but also neutral fats and phospholipids. The spleen and marrow also showed hyperplasia of erythropoietic and myelopoietic cell series. There were several small foci of encephalomalacia, with a few phagocytes and lymphocytes. These seemed most likely to be micro-infarcts due to atherosclerosis of cerebral arteries, although we do not have sections through specific occlusions.

The heart weighed 320 gm., which is slightly above the normal range for our patient's height and severe emaciation, and this is compatible with the brief history of hypertension. The two striking things about the heart and vessels were the distinct pallor

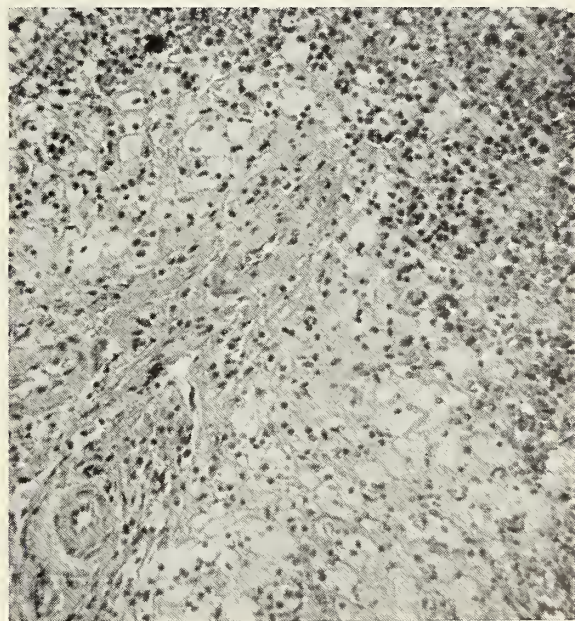


Figure 6. Medium power view of xanthomatous splenic follicle. The branching central arterioles in lower left field are surrounded by numerous, large, foamy cells.

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of fatty degeneration of the inner half of the myocardium attributed to ischemia, and the unusually numerous and soft atheromatous deposits around the aortic ring and involving the aorta, coronary arteries, and the larger visceral arteries, attributed to hypercholesterolemia. The renal arteries showed greatly thickened walls, and there were atheromata covering the intimal surfaces. This may conceivably explain the hypertension which was present up to the last two admissions.

There was no grossly visible evidence of scars or ischemic atrophy. Since the kidneys were of equal size, it is difficult to believe that there was any significant kinking of the right renal artery or compression of the kidney itself by the enlarged liver. There was no constricting perinephritis. Microscopically, there was nothing to relate to the hypertension; no arteriolar changes were seen anywhere. There was no evidence of primary or metastatic tumor in the kidney, and the misleading cytologic studies must, therefore, be filed under the category of false positives.

The probability that the damaged liver contributed (by its increasing inability to detoxify aldosterone and anti-diuretic hormone) to the patient's arterial hypertension, seems negated by the existence of normal blood pressure readings on his last two admissions when liver function was decreasing rapidly.

In regard to the relationship between the two main groups of lesions, (a) hypercholesterolemia, atheromatosis, and xanthomatosis; and (b) the cirrhosis and hepatoma: the serum cholesterol dropped steadily from over 1000 mg. per cent (52 per cent esters) three months before death to 472 mg. per cent (12 per cent esters) two days before death, and the liver biopsy showed numerous foamy xanthoma cells three months before death. These and the hyperalbuminemia three months before death indicated that the hypercholesterolemia antedated the hepatoma and liver damage. Moreover, the absence of fibrous tissue and inflammatory cells from the admittedly small needle biopsy specimen, the disproportionately low levels of alkaline phosphatase and direct-reading (one minute) serum bilirubin, and the absence of other evidence of obstructive biliary disease until very late, rule out the theory that this might have been the usual obstructive diffuse biliary cirrhosis or pericholangiolitic cirrhosis³ with secondary hypercholesterolemia and hepatoma. Furthermore, it seemed most unlikely that the severe arterial atheromatosis and tissue xanthomatosis were produced during the last three months as the serum cholesterol levels fell. The sharp decline of esterification indicated that the serum cholesterol fell because of failure of liver function rather than because of tissue deposition of cholesterol.

In summary, I believe that this patient had two diseases: (a) idiopathic non-familial hypercholesterolemia with tissue xanthomatosis and atheromatosis; and (b) sub-clinical hepatitis and postnecrotic cirrhosis, subsequent well-differentiated juvenile type of hepatocarcinoma with biliary, vascular, and parenchymal invasion and compression, ischemia, pseudo- and complete infarcts of the liver, pulmonary metastases, liver failure, hepatic coma, and death. If, in deference to Dr. Berry's axiom earlier today on the number of allowable diseases, I had to put all of these together into one picture, I would unwillingly compound a series of improbabilities. These would be based on the as yet poorly substantiated concept that xanthomatosis of the liver can produce "hepatocellular hypercholesterolemic cirrhosis."⁴ If this is true, hypercholesterolemia could then lead successively to xanthomatosis and cirrhosis, hepatoma, liver failure, and death.

Summary

Dr. Delp: Neither primary hypercholesterolemia nor primary carcinoma of the liver is a rare entity, but a combination of the two bearing a vague causal relationship to each other is unusual.

In retrospect the clinical impressions first voiced upon admission are still sound, i.e., hypernephroma with metastasis, melanoma with metastasis, and primary carcinoma of the liver. Failure to suggest hepatoma because of clear evidence of cirrhosis is not acceptable, because primary neoplasm is not uncommonly seen in children and young adults without previous existing cirrhosis. Correlation of the malignant liver lesion and the high blood cholesterol is expecting too much of the clinician.

Pathological Anatomical Diagnosis

Primary

Postnecrotic cirrhosis, moderate.

Primary carcinoma of the liver, hepatic cell type, with invasion of portal and hepatic veins, metastases to the lungs and the hilar lymph nodes, and extension to the anterior wall of the abdomen.

Incomplete and complete organizing infarcts of liver.

Bile thrombi in canaliculi of liver and small intrahepatic bile ducts with generalized jaundice.

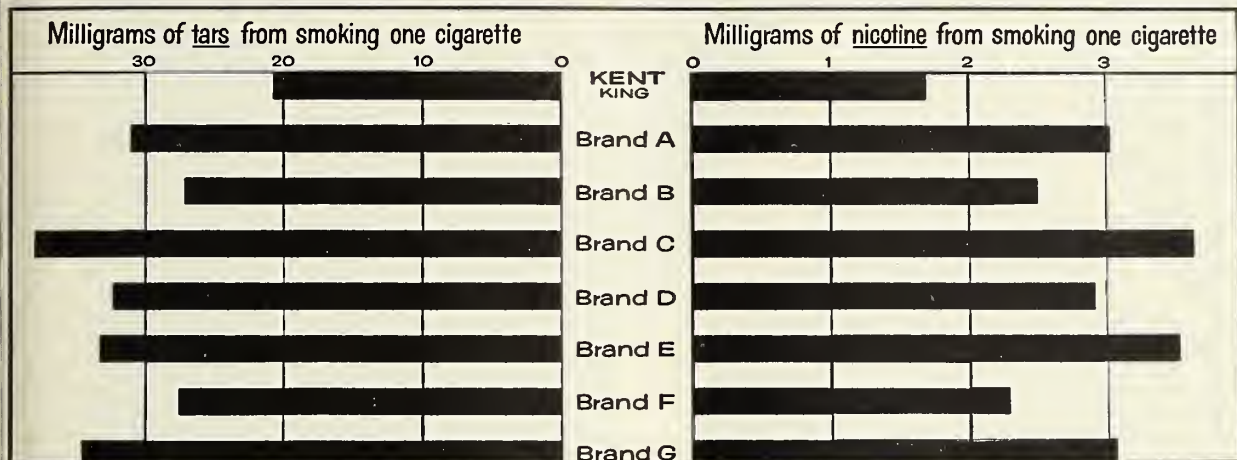
Hyperplasia of the bone marrow; foci of erythropoiesis of the spleen.

Recent and organizing localized fibrinous peritonitis of the subdiaphragmatic space and between liver and anterior wall of abdomen.

Proliferation of pale pleomorphic protoplasmic astrocytes of the brain.

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Subacute interstitial pancreatitis and Baggenstoss changes of pancreas, moderate.

Cholemic and hemoglobinuric nephrosis.

Xanthomatosis involving spleen, liver, lung, abdominal lymph nodes, pancreas, and bone marrow.

Atherosclerosis of the aorta, coronary and renal arteries.

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PHYSICIANS' ACTIVITIES

Dr. Harry G. Gianakon, of the University of Kansas School of Medicine, is the author of a paper, "Psychiatric Aspects of Pain," published in the July issue of *The Journal-Lancet*.

A physician new in this state, **Dr. Wilmer A. Harms**, has announced the opening of an office in Hesston.

Dr. Henry C. Eichmann, who has been practicing in Norwich since 1949, moved to Walton, New York, last month and is practicing there in association with three other physicians.

Color slides of a trip around the world with 16 other doctors were shown by **Dr. Willard J. Kiser**, Wichita, at a recent meeting of the Wichita Exchange Club.

Dr. Robert E. Delphia, a 1956 graduate of the University of Kansas School of Medicine, completed internship at St. Joseph Hospital, Kansas City, Missouri, in July and has begun practice in Olathe in association with **Dr. William McCann** and **Dr. Joseph Pierron**.

A paper by **Dr. E. Grey Dimond**, of the University of Kansas Medical Center, "The Generalist and the Internist," was published in the July 20 issue of the *Journal of the American Medical Association*.

Dr. Francis T. Collins, Topeka, and **Dr. Norton L. Francis**, Wichita, were among a group of physicians who attended the Boy Scout encampment at Valley Forge, Pennsylvania, last month.

A refresher course offered by the American Society of Anesthesiologists, Inc., at Los Angeles in October includes a paper by **Dr. Paul H. Lorhan**, of the University of Kansas Medical Center, "Geriatric Anesthesia."

Dr. Donald Wilcox, who has been practicing in Johnson County, has accepted appointment as acting director of the Kansas City-Wyandotte County Health Department.

A physician who has practiced in Hardtner for 21 years, **Dr. Hiroshi Yasuda**, has moved to Anthony and is practicing there in association with **Dr. H. L. Galloway**.

Dr. William Treckell, who recently completed a three-year residency in general surgery at the Staten Island Public Health Service Hospital, New York, has begun practice in Halstead at the Hertzler Clinic.

Dr. Kurt R. Reissman, associate professor of medicine at the University of Kansas School of Medicine, left August 1 to serve as visiting professor at the University of the Philippines College of Medicine at Manila. After eight months in the Philippines, he will visit scientific laboratories in England, Sweden, and Germany.

The American Board of Internal Medicine announces that **Dr. James C. Dowell**, Lawrence, has been certified as a diplomate.

Dr. Charles M. Poser, of the University of Kansas Medical Center, has been given the rank of assistant professor of neurology and will form a new section of experimental neurology within the department of medicine.

The United States Committee of the World Medical Association has announced the appointment of **Dr. L. S. Nelson, Sr.**, Salina, as chairman of the organization in Kansas.

Dr. Philip J. Antrim, who has been practicing in

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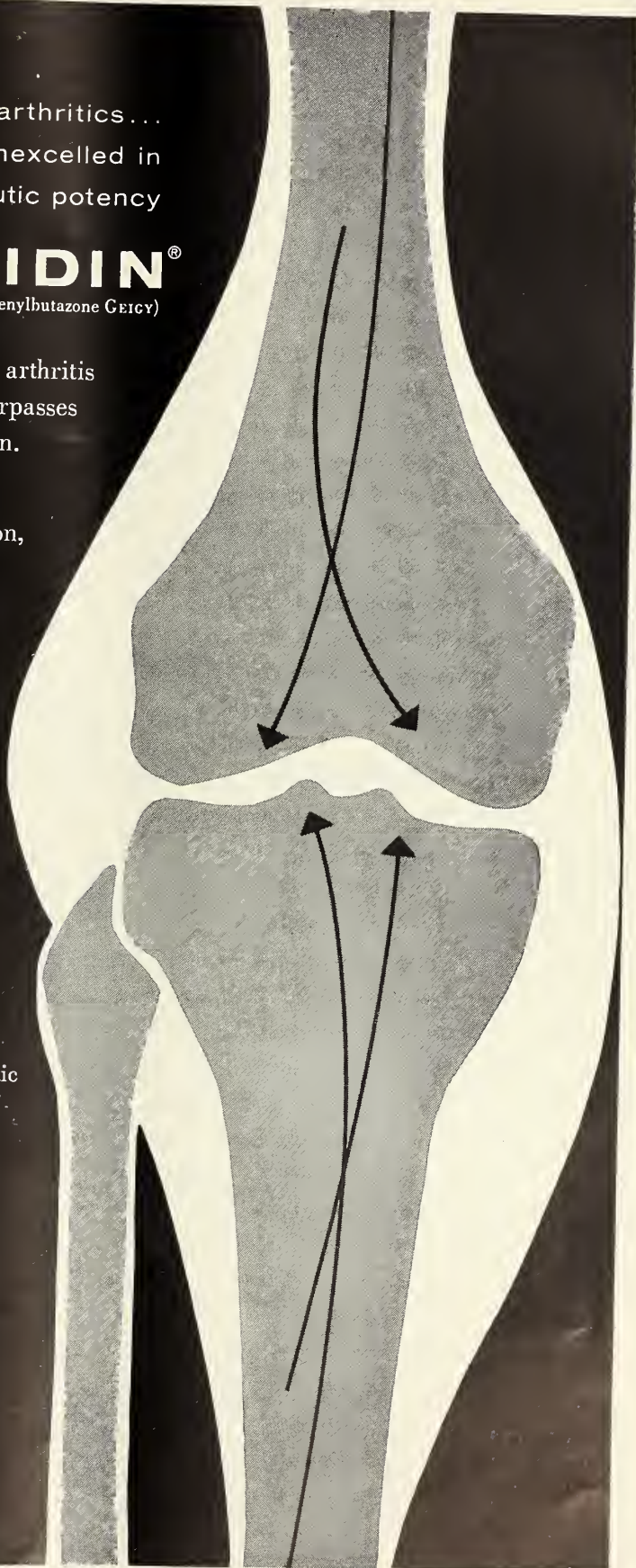
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Russell since 1955, has moved to Attica and is now engaged in general practice there.

A feature story about **Dr. James G. Lee** was published in the August 15 issue of the *Eudora News*, in connection with a luncheon given in his honor by the Eastern Star on the occasion of his 89th birthday. Dr. Lee has been a member of the Eastern Star for a longer period of time than any other person in Kansas.

The Nelson Clinic, Manhattan, announces that **Dr. John McCrary** has joined its staff as a specialist in obstetrics and gynecology. Dr. McCrary, a graduate of the University of Nebraska College of Medicine in 1950, has been teaching at that institution in addition to carrying on a private practice.

Dr. Chauncey G. Bly, former associate professor of pathology and oncology at the University of Kansas School of Medicine, has become head of the department of pathology at Highland Hospital, Rochester, New York, and associate clinical professor of pathology at the University of Rochester School of Medicine.

Rural Health Meeting

How to develop more effective rural health programs will be the chief topic of concern at the American Medical Association's second study conference, October 4 and 5, for chairmen and members of state rural health committees. Sponsored by the Council on Rural Health, the conference will be held at Purdue University.

The opening session will be devoted to a discussion of organizational techniques of statewide rural health committees. Another session will feature representatives of leading farm organizations outlining their health programs. Following this latter presentation will be a discussion of ways that the medical profession and agricultural groups can best work together in developing better health programs. Registrants also will have an opportunity to get together with others from their own regions to discuss mutual problems.

Three New A.M.A. Exhibits

Three new exhibits previewed at the American Medical Association's 1957 Public Relations Institute in Chicago August 28-29 are now available for bookings by state and county medical societies.

(1) "Digestion"—shows the organs involved in digestion, the passage of food through the body, the

mechanics of swallowing, the action of the stomach and intestines, and the body's absorption of food. (2) "Alcoholism Is Your Business"—(for professional audiences) gives the viewer an opportunity to eavesdrop on a conversation between a distraught spouse and the family physician over the treatment of alcoholism. (3) "Organs of the Human Body"—three dimensional models of the torso show location of various organs in the body and their functions. Further information on these displays may be secured from the A.M.A. Bureau of Exhibits.

DEATH NOTICES

LEWIS A. CURRY, M.D.

Dr. L. A. Curry, 63, Topeka physician who specialized in obstetrics and gynecology, died on August 11 after an illness of two weeks. A graduate of Rush Medical College in 1922, Dr. Curry practiced first in Winchester, remaining there for 12 years. He later took postgraduate work at Tulane University and then practiced in Topeka for 25 years. He was a member of the Shawnee County Medical Society and of the Central Association of Obstetricians and Gynecologists.

CHARLES FRANCIS McNAIR, M.D.

Dr. C. F. McNair, 79, an honorary member of the Reno County Medical Society since 1949, died at Hutchinson on August 9 after having been hospitalized for four months. A graduate of Kansas Medical College, Topeka, in 1905, he began practice in Castleton, then moved to Haven, and later to Hutchinson. During World War I he served in the Army as a captain in the Medical Corps.

JAMES LLOYD JENSON, M.D.

A coronary thrombosis suffered on July 28 by Dr. J. L. Jenson, Colby, who was vacationing in Colorado, caused his death at St. Joseph Hospital, Denver, on August 13. Dr. Jenson, 71, received his degree from Jefferson Medical College, Philadelphia, in 1912. He opened his office in Colby in 1930 and had been active in Northwest Kansas Medical Society affairs since that time. At the time of his death he was chief of staff of St. Thomas Hospital, Colby.



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Tears of the Poppy

A Review of the History of Opium

ARTHUR B. COLLOM, M.D., *Eugene, Oregon*

With the flourish of modern medicinals, especially hordes of proprietary and synthetic preparations, we tend to forget the role of ancient herbal remedies in medicine. Some of these remedies have played a prominent part in medical therapy for over 2,000 years, forming the basis of modern therapeutics.

It is of interest to consider how herbs were adopted as medicines, and how, in some instances, this use persisted. Their first use was connected with religious and witchcraft healing rituals, and later the use of specific herbs as remedies must have been related to some unusual quality or characteristic as is shown by the following examples: the mountain ash, whose use was based on the beauty of its berries; the mistletoe, by remaining green after its host had become bare; the carminatives and antispasmodics, such as thyme and valerian, by their odor; the mandrake and foxglove, by their unique shapes; henbane and belladonna, by their toxic actions; and the poppy, both by the beauty of its flower and by its hypnotic powers.¹⁶

As late as the 17th century, the pharmacopoeias still contained long lists of herbs, though only a few had any real therapeutic value other than as placebos, and these few were usually adulterated and covered up by many worthless herbs in lengthy and complicated recipes. These many herbs persisted in use largely because their evolution had been unscientific without benefit of clinical experimentation and evaluation, and because the efficacy of a remedy was based, not so much on the type of ingredients, but on the quantity of ingredients it contained.

The whole aspect of ancient herbal remedies is interesting, but too broad for consideration in a paper of this type. For this reason I will use opium as a topic and trace its history from antiquity to modern times. Mention will be made of ancient records that probably indicate its first uses as a therapeutic agent. In some instances where a herbal remedy is referred to, the exact nature of which is not stated, I will include that reference to add interest. Then I will follow its course geographically and chronologically

through the ages to modern time, using classical as well as scientific literature for reference.

We cannot know when the milky juice of the poppy capsule was first used for medicinal purposes, but from allusions to the poppy in antiquity we find that knowledge of its hypnotic power was discovered at an early date. Some translators of the famed Egyptian Eber's Papyrus, dated at near 1500 B.C., attribute the hieratic figure of a couch to opium and thus include opium in several of the contained recipes.*

The following are in Bryan's English translation of Joachim's work on the Eber's:⁴ "Remedy which the goddess Isis prepared for the god Ra to drive out the pains that are in his head—berry of the coriander, berry of the poppy plant, wormwood, berry of the same plant, berry of the juniper plant, honey. Make into one, mix with honey, and smear therewith in order to make him well forthwith. When this remedy is used by him against all illnesses in the head and all sufferings and evils of any sort, he will instantly become well."

"Remedy to stop the crying of a child—pods of the poppy plant, fly dirt which is on the wall. Make into one, strain, and take for four days. It acts at once!" The similarity of the ancients' method of stopping the child's crying over 3,000 years ago to the modern mother's remedy is remarkable.

Some Hebrew scholars claim a reference to poppy juice in the Old Testament of the Bible. The word rosh is used in connection with the word la'anah, or absinthe. Though rosh is translated as hemlock in the authorized version of the Bible, rosh is the Hebrew word for "head," and thus some translate it as poppy-head. Support for this claim is that the Latin word caputa means poppy-heads.¹⁴

The poppy's original home was in Asia Minor, and it went from there to Greece, where it was popular in mythology. According to myth, Ceres created the poppy so she could sleep and forget the loss of her daughter who had been carried off by Pluto.¹⁶ The Greeks must have associated the poppy with both death and sleep, as Thantos (death), Nox (goddess of night), and Hypnos (sleep) were all represented with adorned poppies.

There are also many references to soporifics and

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Collom is now serving his internship at Sacred Heart General Hospital, Eugene, Oregon.

* Macht disagrees and Ebeell does not attempt to translate the hieratic character that Joachim called poppy.



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to opium in ancient Greek literature. In Homer's *Odyssey*¹² (990 B.C.), we find a description of the powers of a drug given to Telemachus, Menelaus, and others by Helen of Troy. "Then Helen, daughter of Zeus, turned to new thoughts. Presently she cast a drug into the wine whereof they drank, a drug to lull all pain and anger, and bring forgetfulness of every sorrow. Whoso should drink a draught thereof, when it is mingled in the bowl, on that day he would let no tear fall down his cheeks, not though his mother and his father died, not though men slew his brother or dear son with the sword before his face, and his own eyes beheld it." A drug of such powers would seem compatible with opium. Helen is said to have received her drug from Polydamna, wife of Thon, the King of Egypt, "where earth the grain-giver yields herbs in greatest plenty, many that are healing in the cup, and many baneful."¹²

According to Xenophon (400 B.C.), a Greek historian, Socrates knew of the sedative action of opium as is seen from the following quotation: "It is my opinion, too, said Socrates, that we drink; wine moistens and tempers the spirits and lulls the cares of the mind to rest, as opium does the body."²⁵

The first authentic reference to the poppy and some of its therapeutic actions is found in a book by Theophrastus, a Greek botanist of about 300 B.C. He describes three kinds of wild poppies, which he calls the horned, rhoias, and Herakleia poppies, stating that they are distinct plants, though they come under one name, (i.e., poppy). He says that they can be used "in a posset of mead for epileptics" and can be used for purging, both upwards and downwards.²³

Heraclides (230 B.C.), the founder of the Empiric School, which rejected anatomy and depended entirely on drugs in the practice of medicine, was the first to record opium as an anodyne in painful diseases.¹¹

The use of the poppy in medicine spread from Greece to the Roman Empire, and mention of its use by contemporaries in both cultures will now be considered. In the Golden Age, the century from 80 B.C. to 20 A.D. when Latin literature attained maturity, Virgil and Ovid refer to the poppy.

A quote from Virgil's *Georgics* is as follows: "For the field is drained by flax-harvest and wheat-harvest, drained by the slumber-steeped poppy of Lethe, but yet rotation lightens the labour. . . ."²⁴

And from Ovid, the following:

"His son was sick and could by no means rest.
She, as she went into his little mound,
Sleep-pouring poppies gathered from the ground.
The whiles she plucked, she tasted it, 'tis said,
And unawares her long, long fasting stayed;

. . . But Ceres fasted, and in milk lukewarm
Gives poppies to the boy, his sleep to charm."¹⁸

Celsus (25 A.D.) in his *De Medicina* described ways of preparing medicinals containing opium for "headache or ulceration or ophthalmia or toothache or difficulty in breathing or intestinal gripings or inflammation of the womb or pain in the hips or liver or spleen or ribs . . ." or for "genital trouble," from which "a woman collapses speechless. . . ." Two such medicinals which counteract pain in the above complaints by producing sleep are as follows: "Poppy tears, dried mandrake, apples . . . mixed with raisin wine. Small quantity either swallowed or dissolved in water and taken as a draught.

"Or take a good handful of wild poppy-heads when just ripe for collecting the juice and put into a vessel and boil with water sufficient to cover it. When this handful has been well boiled there, after being squeezed out it is thrown away; and with its juice is mixed an equal quantity of raisin wine, and heated until of the consistency of sordes, (what is scraped off the skin by the strigil after exercise). When the mixture has cooled, pills are formed, the size of our beans."⁵

In his *De Compositiones Medicamentorum*, Scribonius Largus, in about 40 A.D., gives a good description of the method by which opium is obtained from the poppy capsule,¹⁴ and Pliny the Elder, at about the same time, discusses "diakodion," opium, and "meconium." Pliny, in his *Natural History*, states that the "diakodion" preparation is "made with 120 heads—of wild poppy, steeped for two days in three sextarii of rain water, after which they are boiled in it. You must then dry the heads; which done, boil them down with honey to one half, at a slow heat." He states also that others have added to the above recipe, but that this is "so much ostentation; for the virtue of this simple and ancient preparation depends solely upon the poppy and the honey."¹⁹

Then in the following quotations, Pliny tells how to make opium, and the difference between opium and meconium: "The black poppy acts as a soporific, by the juice that exudes from incisions made in the stalk. . . . This is done at the third hour, in a clear, still, day, or, in other words, when the dew has thoroughly dried upon the poppy. . . . This juice is possessed not only of certain soporific qualities, but, if taken in too large quantities, is productive of sleep unto death even: The name given to it is opium."¹⁹

Then, "when heads and leaves of the poppy are boiled together, the name given to the decoction is 'meconium'; it is much less powerful, however, in its effects than opium."¹⁹

Dioscorides in about 77 A.D. discussed the virtues



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| Thiamine mononitrate | 1.0 mg. |
| Riboflavin | 1.0 mg. |
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of the opium poppy. The following is taken from a translation of his *Greek Herbal*: "... ye common virtue of them (poppies) is cooling. Whence ye leaves and ye heads being sodden in water, and fomented on, cause sleep. . . . But ye heads being sodden by themselves in water to ye half, and then sodden again with honey till that ye moisture be thickened, they make a licking medicine, being lenitive for coughs and distillations of ye artery, and coeliacall affections."⁸

Galen (150 A.D.), who was born in Greece and moved to Rome to practice medicine at the age of 30 years, discussed antidotes and a theriac containing opium. According to him an antidote was used to protect against poison, bites of venomous animals, and affections arising from a faulty diet. The so-called mithridatum, and later theriac, was professed to fulfill all three. Mithridatum was composed by Mithridates, and theriac by Nero's head physician, Andromachus, the latter adding to, and subtracting from mithridatum to prepare his substance. Galen states that "If one takes the drug daily, as did our late Emperor Marcus Aurelius Antoninus"—as well as did Mithridates—"he will be secure against deadly poisons. . . . Thus it is said that when Mithridates preferred to die by poison rather than become subject to the Romans, he could not find anything capable of killing him."¹⁰

Then Galen makes a possible reference to the addictive powers of opium, the first such reference I have found. "And when he (Antoninus) began to get very drowsy at his daily occupations, he took away the poppy-juice." Then "he began to pass the greater part of the night without sleep. Hence he was forced once more to take some of the mixture which contained poppy-juice, as this had now become more or less habitual with him."¹⁰

The fall of the Roman Empire in 400 A.D. marked the beginning of the Middle Ages, a period referred to as the Dark Ages because of the cultural decay. This era brought a reduction in the size of Western herbals, but much was to be gained from the knowledge previously accumulated by the Arabian Empire.

From Greco-Roman culture, medical knowledge was acquired for Persia through the efforts of Nestorius (400 A.D.). He was a native of Constantinople but was banned from his country because of certain religious views. He eventually settled in southwestern Persia where he founded a medical school that survived until the tenth century. Nestorius and his followers translated the knowledge they acquired into Syriac in the hope of continuing the brilliant Hippocratic tradition. Thus with the Mohammedan conquest of Persia, the Arabs found medical treasures of the Greeks and Romans recorded on old Nestorian

parchments.¹⁵ Arabic medicine, therefore, would seem to be of Persian and, indirectly, of Hellenic origin.

The first reference I could find to the use of opium in the Arabian Empire (eighth to twelfth centuries A.D.) was during the period of Avicenna (about 1000 A.D.). He was the dominant figure of the Arabic School of Medicine, all available medical knowledge of the time being codified in his *Canon of Medicine*. Avicenna states, "The most powerful of the stupeficients is opium. Less powerful are: seeds and root-bark of mandrake; poppy; hemlock; white and black hyoscyamus; deadly nightshade; lettuce-seed; snow and ice-cold water."²

Through the Arabs, opium was introduced into India by the spread of Mohammedanism,¹⁴ and into China during the Sung Period (960-1280). Later, Indian traders, then Italian, shipped opium to China. In the early 16th century, Vasco da Gama, by discovering a way around the Cape of Good Hope, opened a new trade route to the Orient for Portuguese merchants. The subsequent influence of opium in India and China will be discussed later in this paper, and now its influence in the West will be followed.

In the late 12th or early 13th century, the leading surgeon of the day was Hugo de Lucca, whose sleeping sponge preparation, used as an inhalation anesthetic, was the basic prescription used by medieval physicians. Hugo was probably educated in Salerno and taught and practiced in Bologna. Unfortunately he left no written records, but his son, Theodoric of Cervia, describes his surgery and the "spongia somnifera" in detail. In the *Surgery of Theodoric*, the great surgical work of the 13th century, we find that the recipe for the "spongia somnifera" contains an ounce of opium along with other present day herbs. The ingredients were mixed in a brazen vessel, and a sponge was placed in it. Then, according to Robinson,²⁰ Theodoric says to "let the whole boil, as long as the sun lasts on the dog-days, until the sponge consumes it all, and it is boiled away in it."

In the middle 14th century, John Arderne, an Englishman and the originator of the operation for fistula in ano, used salves and elixirs containing opium in the following ways: "Anoynt his front, his pulses, his temples, his armeholes, and his lones of his heud and his fete, and alsone he schal slepe so that he schal fele no kuttyng. . . . Also one grayne of opii thebaici to the quantite of drams ss, distempered with a pynte of wyne or more after the mist of hym that schal drynk it, schall make hym that drynketh it for to slepe."

Arderne cautioned those who used medications containing opium against inducing too profound a

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sleep and offered the following method of arousing the patient: ". . . And witte thou that it spedeth for to draw hym that slepeth so by the nose and by the chekes and by the berde, that the spirites be quickened that he slepe nost ouer ristfully."¹

Towards the close of the Middle Ages, and with the beginning of the Renaissance, we find mention of narcotics in general literature. Boccaccio, who survived the Black Death in 1348, and Chaucer describe the use of opium. In the *Decameron* of Boccaccio³ is found a story about a famed physician of Salerno, Master Mazzeo, who was called upon to amputate a gangrenous leg. He was of the opinion that the pain of such an operation could be endured only by the use of an opiate. The physician distilled "a certain water of his composition, which, being drunken by the sick man, should make him sleep so long as he deemed necessary for the performing of the operation. . . ." The potency of the compound was later brought out when the lover of the physician's wife drank the water by mistake, and the wife, supposing the man's deep sleep to be death, put him into a chest.

In Chaucer's *Canterbury Tales* is found the following passage:

"That soone after the mydnyght, Palamon,
By helpyng of a freend, brak his prison,
And fleeth the citee faste as he may go.
For he hade yeve his gayler drynke so
Of a clarree maad of a certeyn wyn,
Of nercotikes, and opie of Thebes fyn,
That al that nyght thogh that men wolde hym
shake,

The gayler sleep, he myghte nat awake."⁶

Then in a much later period we find reference to the poppy in the literature of Shakespeare in the following passage from *Othello*:

"Not poppy, nor mandragora,
Nor all the drowsy syrups of the world,
Shall ever medicine thee to that sweet sleep
Which thou ow'dst yesterday."²¹

In the early 16th century came the famous Paracelsus (a name meaning greater than Celsus), who first used the term "laudanum" for a secret preparation of his own making. Paracelsus is interesting in that he possessed no medical degree, although he acquired considerable real knowledge of medicine and lectured on medicine at the University in Basel, Germany, in 1526. His lectures were preceded by a solemn burning of the works of Galen and Avicenna, and the lectures themselves discredited past and contemporary medicine, setting forth his own theories and methods of treating disease. Though it is not known if his "laudanum" contained opium, for more than a century after Paracelsus, the term

laudanum was applied to solid preparations, some of which did contain opium.¹³

The alcoholic tincture which we now know as laudanum was originated by Thomas Sydenham in 1669. Sydenham, the father of English medicine, is known better by name than by his writing, and his writings are better known than the events of his life. But one thing of Sydenham is certain, and that is his praise for opium which follows: "And here I cannot but break out in praise of the great God, the Giver of all good things, who hath granted to the human race, as a comfort in their afflictions, no medicine of the value of opium, either in regard to the number of diseases that it can control, or its efficiency in extirpating them. . . . Medicine would be a cripple without it; and whoever understands it well, will do more with it alone than he could well hope to do from any single medicine."²²

Thomas Dover, once a student of Sydenham, is another interesting character in medical history. Osler¹⁷ says, "Thomas Dover, the Doctor, has drifted into our modern life on a powder label (to which way of entering the company of posterity, though sanctified by Mithridates, many would prefer oblivion) even to continuous immortality on a powder so potent and palatable" as that of Dover's opiate compound.

Dover is also remembered as a buccaneer who promoted and took part in a privateering expedition to the South Seas in 1708, an expedition which resulted in the rescue of Alexander Selkirk (Defoe's Robinson Crusoe) from Juan Fernandez Island in February 1710, and resulted in the realization of booty valued at 170,000 pounds sterling. Upon his return to England, Dover set himself up in the practice of medicine, though the "spirit of the buccaneer was not dead in the old man, as no occasion is missed either to blow his own trumpet, or to tilt a lance at his colleagues."¹⁷

Dover left to medicine his *Ancient Physician's Legacy to His Country* from which the following is taken: "It has been objected to one part of my book, that I have a great dislike to opiats; and yet, that in the prescription immediately following, I have set down an opiat. Some apothecaries have desired their patients to make their wills, and settle their affairs, before they venture upon so large a dose as I have recommended, which is from 40 to 70 grains. As monstrous as they may represent this, I can produce undeniable proofs, where a patient of mine has taken no less a quantity than an hundred grains, and yet has appear'd abroad the next day."⁹ He explains further that the other ingredients that are mixed with the opium diminish its potency.

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containing opium sprouted out in the 17th and 18th centuries such as Matthew's Pills, Starkey's Pills, Black Drop, and paregoric. Both paregoric and laudanum (mentioned earlier) were titles given to a variety of preparations listed in the *Pharmacopoeias*, the common ingredient of all being opium.¹³

Of great historical interest is the spread of the opium influence in China and India during the last half of the 18th century. Through Portuguese merchants and, later, through the Dutch East India Company, Chinese importation of opium increased rapidly. Opium smoking came in during the era of Dutch control and, indirectly, was an American contribution. After Sir Walter Raleigh introduced tobacco into England from America, the Dutch thought of smoking opium and contrived a blend of tobacco and opium. By the resultant increase in opium trade to both India and China, the history of the world was altered.

Opium trade and production was in large part responsible for the war between England and France for control of India, for the English conquest of India for control of the latter's opium production, for England's two wars with China in 1839 and 1851 which have been called the Opium Wars, and for the moral degeneracy of millions of Orientals.

Also of historical interest is the great Persian famine of 1871-1872 which resulted from most of the arable land in Persia being sown with poppy seeds.

I will not end a story of opium on a note of degradation or human suffering, but choose rather to conclude by telling a story of the discovery of the active principle of opium, the alkaloid responsible for the pain-relieving quality of this ancient herb.

In 1803 a drug clerk, while working in an apothecary shop at Paderborn in Prussia, looked at a piece of crude opium gum and was curious about the ingredients it might contain. His curiosity led him to extract a piece of the gum in water, and then to add ammonia to the extract, thereby obtaining some crystals. He went no further with the simple experiment at this time. Then several years later, after he had established a pharmacy of his own, he invited three friends into his shop. He related to the friends how he had obtained crystals from gum opium, and that he had found that the crystals put dogs to sleep. The difficulty at this time, he added, was that the proper amount of the crystals to be given to man for similar results was undetermined. The purpose of the invitation was beginning to clarify itself to the guests. They expressed their willingness to sacrifice for science, but pleaded that it be a little dose at first. The host replied that only half a grain washed down with alcohol and water would be used.

During the subsequent "human" experiment, the host put down a description of his own sensations. After the first one-half grain dose he noted that his face began to flush. With the second dose, 30 minutes later, he became somewhat nauseated and then lethargic and numb. Then following the third dose, after another 30-minute period, he became dreamy with marked depression, concluding that the point of poisoning had been reached. The conclusion was right.⁷

The man of this classical experiment and description was Frederick Wilhelm Serturner, the discoverer of morphine. The Greek god of dreams, Morpheus, had indeed been honored.

In all, this has been the story of an ancient herb, the "tears" of the poppy, which, as no other herb, has been referred to in great historical and literary works, has influenced the course of history, causing famine and war, and has influenced the lives of millions of people, causing much grief and yet giving much relief. This has been a paradoxical herb, unsurpassed for causing misery through its addictive powers, but unsurpassed also as a reliever of pain and anxiety perhaps never to be replaced by modern "new" drugs.

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1. Locket, S.: Brit. M.J.
1:809 (Apr. 2) 1955.

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2. Wright, W.T., Jr., et al.: J. Kansas
M. Soc. 57:410 (July) 1956.

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Nutrition in Pregnancy

Because nutrition plays such an important role in all phases of reproduction, the A.M.A.'s Council on Foods and Nutrition has selected "Nutrition in Pregnancy" as the title of its 1957 symposium. The meeting will be held October 11 at the University of Missouri Medical Center, Columbia, Missouri. Joint sponsors with the A.M.A. are the University of Missouri Medical School and Adult Education and Extension Service and the Boone County Medical Society.

The symposium will provide an excellent opportunity for physicians, nutritionists, dietitians, nurses, and others to acquaint themselves with current findings in nutrition and the practical application of these findings to the management of obstetrical patients.

Topics to be discussed include: the influence of maternal nutritional level on the fetus and infant; metabolic and biochemical changes in normal pregnancy; importance of nutritional state of mother prior to conception; nutrition experiments as an instrument of teratologic research; the effect of the reproductive cycle on nutritional status and requirements; dietary habits during pregnancy; panel discussion to review epidemiologic studies.

In the past 56 years mortality from tuberculosis has declined from 199 to 8 per 100,000 population, according to Health Information Foundation. While this is remarkable progress, the Foundation notes, tuberculosis is still a great health problem, with 100,000 new cases reported in the United States in 1955.

Sodium and Potassium

(Continued from Page 584)

never exceeds normal values, and the retention of sodium is not as pronounced as in patients who are not given such therapy. From the foregoing there would seem to be a definite therapeutic indication for administering potassium by mouth. On the other hand, it would seem that sodium is not only useless but might even be contraindicated during this period.

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More than 100,000 disabled workers during August received checks under the Old Age and Survivor's Insurance disability payment program, the first group to receive the benefits. The program went into effect in July, and the August payments are for that month. Disabled workers whose applications are filed before the end of the year will be paid retroactively for all months from July on, but starting in 1958, O.A.S.I. will not make payments for any month prior to filing of the application.

Work is going forward on the formation of state and county chapters of the Medical Service Society of America, a national organization of professional ethical medical detail men. Mr. Noble S. Birkett, Oklahoma City, is president of the association.



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BOOK REVIEWS

Goepf's Medical State Board Questions and Answers. Ninth Edition. By Harrison F. Flippin, M.D. Published by W. B. Saunders Company, Philadelphia. 659 pages. Price \$8.00.

This book should be of particular interest to any doctor who plans to take a state board examination for licensure. In addition, this book is a valuable source for review for any doctor who is interested in a wide coverage of the medical field in the form of questions and answers. The chapter on medical jurisprudence should prove the book's worth to any doctor.

The editor and editorial board who made this publication possible have fulfilled the aims of the original author, namely to present to the student of medicine reliable, up-to-date medical information in convenient, concise, and adequate form.—O.W.D.

An Atlas of Cardiac Surgery. By Jorge A. Rodriguez, M.D. Published by W. B. Saunders Company, Philadelphia. 250 pages. Price \$18.

The book is attractively bound and although of nonstandard size is convenient to handle. It lies flat when opened, and the arrangements of the text and illustrations are clear and inviting. The book was prepared by the artist and author after visiting clinics of the outstanding American surgeons interested in surgical treatment of the diseases of the heart. The book is divided into six sections and index. The sections are as follows:

1. Surgical Anatomy of the Heart and Great Vessels.
2. Adjuvants Cardiac Surgery, including instruments and adjuvant devices, special considerations in anesthesia, hypothermia, and mechanical extracorporeal circulation.
3. Surgery of the Great Vessels, including patent ductus arteriosus, coarctation of the aorta, aneurysms of the thoracic aorta, vascular rings, aorticopulmonary fistula, and transposition of the great vessels.
4. Surgery of the Valves of the Heart, including mitral stenosis, mitral insufficiency, pulmonary stenosis, and aortic insufficiency.
5. Surgery of Congenital Defects of the Heart, including tetralogy of Fallot, atrial septal defects, and ventricular septal defects.
6. Pericardiectomy, Revascularization Procedures, Wounds of the Heart, and Cardiac Arrest.

The information in each section is authentic and

is ably illustrated. The section on surgical anatomy of the heart and great vessels is written from the standpoint of the surgeon and although the detailed anatomy that would be preferred by the pure anatomist is not described, there is adequate detail for an understanding of surgical procedures. The information recorded in the section under adjuvants to cardiac surgery is written in summary form and is well done. Significant details are given, and the overall estimate of the significant factors is complete.

Descriptions of the various techniques of surgery are those carried out by recognized authorities. The illustrations are clear and are easily followed. The complications encountered during various procedures are also considered, and methods of management given adequate emphasis.

There is a minimum number of factual, typographical, and illustrative errors. The book is well indexed, and desired information can be quickly procured. I would consider it an outstanding surgical atlas and worthy of a place in the library of all persons interested in diseases of the heart.—F.F.A.

Physical Diagnosis—Correlation of Physical Signs with Certain Physiological and Pathological Changes in Disease. Second Edition. By Simon S. Leopold, M.D. Published by W. B. Saunders Company, Philadelphia. 537 pages, 379 illustrations, 25 color plates. Price \$9.00.

The first edition of this excellent text was published in 1932, the author being assisted by several of his Philadelphia colleagues who contributed chapters concerning their own special interests. These same authorities have collaborated in the revision and writing of the second edition.

The author has succeeded in correlating physical findings and clinical picture with the basic pathology, etiology, and disturbed physiology responsible for particular findings. Particular emphasis is given to methods of taking a satisfactory history, 34 pages being used for this purpose. Experienced physicians will find this section of the volume helpful, especially the portion devoted to the psychiatric survey.

All the chapters are well written and excellent for teaching of medical students. The contributors have helped to make several of the chapters especially valuable and worth study by all physicians. The chapter on Sounds from the Thorax: Acoustic Principles by S. Reid Warren, Jr., is helpful in making one understand and interpret physical findings properly, in addition to imparting proper methods to elicit such findings. The chapter on the circulatory system is thorough; the illustrations, especially the phonocardiograms, help the examiner understand better



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the time relationships between the waves in the electrocardiogram, heart sounds, and the types of murmurs observed with various valvular functional abnormalities.

The chapter on the neurological examination is thorough, easy to read and comprehend. The chapter on pediatric examination is especially helpful to the student, general practitioner, and pediatrician alike.

This edition contains a thorough presentation of the methods of physical examination and interpretation of the findings for each of the systems. This volume would be useful in any physician's library.—C.C.U.

The Pharmacology of Psychotomimetic and Psychotherapeutic Drugs. Annals of the New York Academy of Sciences. Edited by Otto V. Whitelock and Frank N. Furness. Published by the Academy, 2 East 63rd Street, New York 21, New York. Price \$5.00.

This is an important work in the present era of increasing interest in study and use of drugs that influence man's mood and behavior. Since the work contains much material of a highly technical nature, this review will limit itself to those items of particular interest to the clinician.

Part I (Clinical and Biochemical Aspects of the Psychotomimetic Agents) opens with Osmond's review of the clinical effects of psychotomimetic agents. Our Canadian colleague, well known for his work in this field, writes clearly and lucidly to highlight this section of the work. His own choice of a term for these drugs is "psychedelic," meaning "mind-manifesting."

In his article "Neurochemistry and Serotonin: A Chemical Fugue," Dr. Irving H. Page describes how an interest in a problem of cardiovascular disease 28 years ago played its part in the research that led to the discovery of serotonin.

Parts IV and V will probably be of greater interest to the practitioner. Part IV deals with the clinical, behavioral, and pharmacological effects of psychotherapeutic drugs, while Part V deals with neurophysiological and biochemical effects. Outstanding is the survey by Margolis entitled "Pharmacotherapy in Psychiatry: A Review," the result of a survey to determine the value of chlorpromazine and reserpine. In the diversity of opinions expressed about the usefulness of these drugs and the techniques in their utilization, every physician will find opinions with which he may agree or disagree.

Despite many studies, including those published in this volume, there is not yet at hand convincing neurophysiological evidence to explain the site and

mode of action of ataractic drugs (reserpine, chlorpromazine, and others). The fact that we have only minimal understanding of the chemistry and physics of normal thought is a basic lack. Add to this lack of knowledge the fact that the problems of human psychopharmacology are many and difficult, and one can easily see how complex is the task of determining the biochemical mechanisms by which these drugs act. The work of the thoughtful and dedicated researchers reflected in this volume is highly commended.—I.K.

The Doctor as a Witness. By John Evarts Tracy. Published by W. B. Saunders Company, Philadelphia. 221 pages. Price \$4.25.

With the universal increase in the liability claim, more and more physicians are being invited to offer medical opinion and display their medical knowledge in courts of law. These are strange environs to the average physician for the display of his special knowledge, training, and experience, and often the rules of behavior are quite foreign to this same training and background.

It is, therefore, refreshing and most useful to have available in such clear and readable fashion the material organized in *The Doctor as a Witness*. Not only are the rules of behavior carefully explained and the reasons behind them delineated, but special suggestions to the physician to assist him in participating in such events are lucidly presented. Individual chapters are devoted to the special circumstances of Workmen's Compensation proceedings and of malpractice cases, and particularly important is the chapter devoted to instruction as to what makes a good medical witness. This small but most useful and readable book should be available to every physician and particularly those who frequent the arena of medical legal practice.—J.A.S.

Practical Gynecology. Second Edition. By Walter J. Reich and Mitchell J. Nechtow. Published by J. B. Lippincott Company, Philadelphia. 647 pages. Price \$12.50.

This volume justifies its name in that it is written with major emphasis on the therapy and management of gynecologic disorders. The style is informal: it seems to be a compilation of lecture material and has an easy-to-read conversational quality as distinguished from some of the more formal and stilted texts. Its at-times-breathless pace and frequent admonitions to think of this and not forget that, however, remind one of the lecturer whose emphasis on his specialty brings moans from the student body because he seems to feel that his subject should always take priority

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in the student's mind. Which reminds us, in turn, of our medical school roommate who always contended he would have to specialize because he was not smart enough to be a general practitioner.

It is a better text for the student than he is apt to realize for he tends to think of gynecology only in terms of prospective surgery, not realizing how much office work will fall in this category. This book wisely avoids overextension into surgical techniques and thereby establishes itself as a helpful reference for diagnosis and a practical guide to office treatment. It is liberally and excellently illustrated. In particular, the color plates are clear and faithful in color values. —D.E.G.

The Chemistry and Biology of the Purines, Ciba Foundation Symposium, G. E. W. Wolstenholme and C. M. O'Connor, Editors. Published by Little, Brown and Company, Boston. 327 pages. Price \$9.00.

A wide variety of aspects of the class of purines is treated in this book. From fundamental physico-chemical properties of purines to the clinical uses thereof, the subject matter is well presented by recognized authorities in the field. Almost no discussion is devoted to the historical development of purine research, and practically all the discussion concerns the results of recent research.

It is not likely that all readers will find every presentation in the symposium of interest because of the scope of the symposium. Although the material is well given and documented in general, the discussion after each presentation is occasionally vague and incompletely and inconsistently documented.

On the basis of their development, clarity and import, the best sections seem to be the following: "The Use of 6-Mercaptopurine in the Treatment of Leukemia" by D. A. G. Galton, "Puromycin" by B. L. Hutchings, "On the Activation of the One Carbon Unit for the Biosynthesis of Purine Nucleotides" by G. R. Greenberg and L. Jaenicke, and "The Enzymatic Synthesis of Inosinic Acid *de novo*" by J. M. Buchanan et al. Although the symposium was held more than a year ago, the most significant material presented is still the latest word in purine research.—L.C.M.

The Fight for Fluoridation. By Donald R. McNeil. Published by Oxford University Press, Inc., New York. 241 pages. Price \$5.00.

This is a well-written and factual description of the development of fluoridation, a proved public health measure which materially reduces the rate of

dental decay, the most common chronic disease of mankind and the most prevalent of all childhood afflictions.

Dr. McNeil has described very interestingly the history of fluoridation, beginning with Dr. Frederick S. McKay's early investigation, in 1901, of the "Colorado brown stain."

The author reports on the completion of the two leading ten-year research studies, begun in 1945 at Grand Rapids, Michigan, and Newburgh, New York, demonstrating that fluoride added to a fluoride-deficient public water supply reduces the rate of dental decay by approximately 60 per cent. He pointed out that the findings should aid the proponents in answering the opponents' earlier plea to "wait until the experiments are finished."

The author gives an account of the public controversies which have arisen in some areas where fluoridation was being considered, specifically pointing to the early heated conflicts experienced in Wisconsin with the opponents of fluoridation. He also relates some of the tactics employed by the opponents of fluoridation.

The Fight for Fluoridation is recommended reading for anyone interested in the fluoridation of public water supplies.—W.R.B.

A Woman Doctor Looks at Love and Life. By Marion Hilliard. Published by Doubleday and Company, New York. 190 pages. Price \$2.95.

Dr. Hilliard says, "I have been watching the many lives of women for a quarter century; the adolescent with her terrible fears, the young wife with her dismay at love-making, the unmarried mother with terror in her eyes, the career woman with her longings, the older woman with her loneliness. I know them all and I would be insensitive and a poor doctor if I didn't try to help."

In this book she certainly has done just that. It is a series of informal discussions on the many problems of women of all ages. Dr. Hilliard is sometimes outspoken, but always realistic. To all women she advises, "Don't waste your strength in being outraged because life is difficult for you. Assume that life naturally is difficult, will never be easier. Accept the inevitables and live vigorously."

To the expectant mother, "The drama of birth, the torment wrapped with exultation beyond self, is the truest and finest moment a woman can know."

To the adolescent, "This is your time for learning, the only time you will get until you die." And, "Put education first just now, afterward you'll have 50 years left for loving." And, "Take it easy on your

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On "Women's Greatest Blessing": "Generations of panicky women have spawned enough untruths about the menopause to panic the next five generations."

On old age: "Retirement, I feel, means a new adventure in living—not a stopping."

Excerpts from this book have already been published in *Reader's Digest* and *Pageant* and perhaps others.

This reviewer is ordering copies of the book to lend to patients. He believes it could almost be called a "Handbook for Living" for women.—N.H.O.

The Changing Patient-Doctor Relationship. By Martin G. Vorhaus, M.D. Published by Horizon Press, New York City. 310 pages. Price \$3.95.

If you wish to improve in the "Art of the Practice of Medicine," this is your book! Application of the new psycho-social approach to the patient-doctor relationship will result in better doctors and happier patients.

Too infrequently the patient leaves the doctor's office with the feeling that the doctor is a wonderful person. "He knows his stuff. He gave me a fine examination and really put his finger on my problem. I'm sure he's going to help me."

Too seldom does the doctor usher out the patient with the feeling, "There goes a sensible cooperative patient. He'll follow my recommendations and reap benefit. What a pleasure it is to take care of a man like that! Why aren't there more like him?"

This book is a study in a means to an end: to bring the doctor and patient into the closest rapport, so the doctor may fulfill his obligations to the patient.

After an academic description of the patient and how he became one, and of the doctor and how he became one, the author portrays the doctor as a builder of bridges and shows how the bridges of learning, accepting responsibility, resolving conflicts, acquiring empathy, integrating the patient's attitudes with his illness, striving for personal balance in subjective reactions, and maintaining flexibility in personal adjustments, can make a good doctor of a scientifically trained healer.

An unusual feature of this book is the presentation of five long and detailed case histories which illustrate

how the changing patient-doctor relationship has benefitted all those concerned.

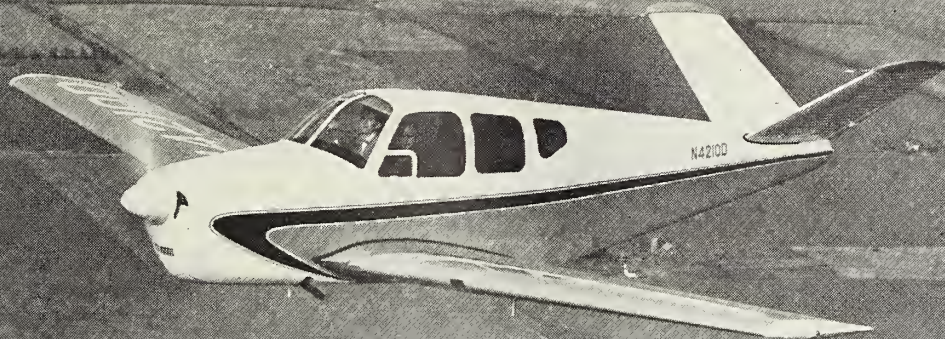
Because anxiety is man's number one malady at present, the need for psychotherapeutic guidance is increasing. This is a service the doctor must offer along with pills, shots, and operations. Because the patient and his environment are always changing, so must the doctor be changing. He must change from a novice to a master, but more than this he must forever be as changing as the patient, as a person. He must always modify his values and broaden his horizons. As he better understands his patients, so does he better understand his friends and his family. He has better insight about others—and above all about himself! The doctor learns that he is not a creator, but the servant of the Creator. Only the patient can and should make of his life what he desires. To know what is best for the patient is not the point or end of the problem or case. The patient must find it out, accept it, and completely put it into action before the doctor can achieve success with his patient.

Reading this book will make you a better doctor! —C.M.B.

Therapeutic Exercise for Body Alignment and Function. By Marian Williams, Ph. D., and Catherine Worthington, Ph. D. Published by W. B. Saunders Company, Philadelphia. 127 pages. Price \$3.50.

This manual is a revised and somewhat enlarged version of a syllabus published several years ago by the same authors. Both are physical therapists with a background of physical therapy education, and they state that the manual is designed for the use of all persons dealing with problems of body alignment and function. However, reference is made in the text only to physical therapists; the word physician never appears, nor is there any evidence of interest on the part of the authors to suggest that therapeutic exercises are an important part of medical treatment and that close liaison with the physician is necessary.

The manual is divided into several convenient areas: a definition of normal posture, methods of testing for and recording of body alignment, a section concerned with general features of the therapeutic exercise program, the principles of exercise treatment specifically applied to various body areas, positions of the body in activity and rest and, finally an appendix which reviews the anatomical location and role of the primary muscles concerned with body alignment and function. The text is brief, is written in a clear, concise style, and is profusely illustrated



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with sketches which demonstrate the pertinent details of the text in superb fashion. It is difficult to conceive a text that would teach therapeutic exercise, within the above limits, more admirably.

It is disappointing to find no reference to the physiology of therapeutic exercise. Reference is made to electromyographic studies, to general reflex activity, and to muscle tone, but cognizance is not taken of the important physiological studies of muscle, circulatory and nervous system as related to therapeutic exercise. The concept of therapeutic exercise as resting solely on rigid considerations of structural anatomy is steadily giving way to the more complex but more realistic one of changes in the dynamic functional balance of movement patterns in rest and in motion. In this latter area lies a greater field than contemplated in this manual.

Physical therapists and nurses, especially in their student and early graduate days, will find the manual a valuable one. Physical education majors will gain the same benefits. Physicians and medical students would do well to acquaint themselves with this manual to supplement the scanty training in therapeutic exercise given in modern medical curriculums. —D.L.R.

ANNOUNCEMENTS

The University of Nebraska College of Medicine announces a series of courses for the 1957-1958 year: September 30-October 2, electrocardiography I; January 16-17, obstetrics and gynecology; February 7-8, endocrinology; March 12, diseases of the skin; April 7-8, pediatrics; April 9-11, postgraduate assembly and Poynter lecture; May 7, trauma; May 8-9, allergy. Courses approved for credit by A.A.G.P. Information from Office of Postgraduate Affairs, College of Medicine, Omaha, Nebraska.

Course in orthopedic surgery and fractures, University of Texas Postgraduate School of Medicine, El Paso, September 29; followed by scientific meeting of American Fracture Association, Hotel Cortez, El Paso, September 30-October 2. Both approved for credit by A.A.G.P. Address El Paso County Medical Society, 1301 Montana Street, El Paso.

Convention of American College of Gastroenterology, Somerset, Boston, October 21-23, followed by course in postgraduate gastroenterology, October 24-26, with Dr. Owen H. Wangenstein and Dr. I. Snapper as moderators. Advance registrations, American

College of Gastroenterology, 33 West 60th Street, New York 23, New York.

Course in occupational skin problems, Departments of Preventive Medicine and Dermatology, University of Cincinnati, and U. S. Public Health Service, at Kettering Laboratory, Cincinnati, October 28-November 1. Limited registration. Write Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda, Cincinnati 19, Ohio.

Symposium on fluorides, December 9-11, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda, Cincinnati 19, Ohio.

Two-week course in radiological safety, January 6-17, Institute of Industrial Medicine of New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York. Tuition \$90.

Sectional meetings, American College of Surgeons: Dallas, January 9-11; Jackson, Mississippi, January 16-18; New York City, March 3-6; Salt Lake City, March 17-19; Des Moines, March 27-29. Annual clinical congress, Chicago, October 6-10, 1958.

Twenty-fifth annual session, Omaha Mid-West Clinical Society, Sheraton-Fontenelle Hotel, Omaha, November 4-7. List of speakers on Page 645, this issue.

The Bureau of Public Assistance reports that incomplete statistics indicate that hospital care is the most expensive item involved in the medical care of individuals supported by federal-state public assistance programs. Involved are four categories: the needy aged, blind, dependent children, and permanently and totally disabled. In addition to helping states pay for these people's support, the U. S. also sets aside additional money for their medical bills, money which must be matched in part by the states. The bureau's survey, for July-December, 1956, includes data from 20 states. Hospital care accounted for 37.9 per cent of the medical costs, nursing homes and home care maintenance for 29.5 per cent, drugs and supplies for 13.8 per cent, physicians' services for 13 per cent and other services for 7.9 per cent. The bureau now is attempting to obtain more complete information from a larger number of states on the cost breakdown in the various items of medical care under public assistance.

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

If dangerous epidemics of Asian flu break out in the country this fall and winter, the medical profession will have its hands full. But the doctors won't be taken by surprise, nor will they lack specific information on proper treatment.

While the attacks in the U. S. were still sporadic and the death rate low—three fatalities in the first 11,000 reported cases—a number of major, nationwide efforts were under way to combat the disease in the months when influenza rates generally are the highest.

1. Acting in coordination with U. S. Public Health Service, the American Medical Association was pressing forward with its campaign to insure that all physicians are informed of how to deal with the disease.

2. In line with recommendations of the A.M.A. committee, a number of state medical societies by mid-August had laid out complete emergency plans, ready to be put in operation if needed.

3. U. S. Public Health Service epidemic intelligence experts were scanning the country for outbreaks that might be Asian influenza, and others were investigating acute respiratory diseases. P.H.S. also set up machinery to keep the medical and health professions informed on nationwide developments in the influenza picture.

4. Advising Surgeon General Burney was a special committee, which included representatives from A.M.A., American Academy of Pediatrics, American Academy of General Practitioners, and the Association of State and Territorial Health Officers.

5. Manufacturers of the vaccine, by running their plants on two or three shifts and seven days a week, were hoping to have produced 60,000,000 cc. by February 1.

There was, of course, the possibility that with Congress in session through most of the summer a vast federal program would be set up, with the U. S. purchasing and allocating the vaccine. It was heartening to the medical profession that this possibility was pretty well eliminated in the early stages when the Department of Health, Education, and Welfare announced the following as official policy:

"The Public Health Service, in cooperation with

the medical profession, will stimulate and promote a nationwide voluntary program of vaccination against the prevalent strain of influenza. It will not, however request federal funds for the purchase or administration of vaccine—except for its own legal beneficiaries. The State and Territorial health officers and the American Medical Association have jointly assured the Surgeon General that community resources, both public and private, will be mobilized to provide vaccinations for persons who are unable to pay for such protection."

This policy was reaffirmed later by the White House, when the President asked for half a million dollars to finance the additional work for Public Health Service. The White House statement said flatly that it did not plan to have the federal government buy vaccine.

The A.M.A.'s Board of Trustees selected as members of the special committee the same physicians who make up the Civil Defense Committee, with Dr. Harold C. Lueth as chairman. In addition to the work of this committee, special articles are being published in the *A.M.A. Journal*, mass circulation media are being used to bring information on Asian influenza to the lay public, and the A.M.A. Council on Drugs is investigating and reporting to physicians on the use of antibiotics in treatment of the disease.

Notes

To wind up a long investigation of the safety of chemical additives to foods, a House committee called in a panel of scientists for two days of discussion. In general they concluded: Be careful about any mandatory federal controls.

Another hearing on weight-reducing preparations sold over-the-counter in drugs stores heard a parade of witnesses, all of whom had about the same opinion: In themselves, the pills all are virtually useless in inducing loss of weight, but their other effects range from harmless to definitely dangerous.

Veterans Administration is increasing fees to physicians under the home-town care program, with the new schedules varying by states and areas. During this fiscal year VA will pay out \$8 million under this program.

A former A.M.A. president, Dr. Elmer Hess, now heads two government advisory committees, the Health Resources Advisory Committee to Office of Defense Mobilization and the Medical Advisory Committee to Selective Service, membership of which is the same. He succeeds Dr. Howard Rusk.



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THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.

Socialized Medicine

"We have had amply demonstrated to us that medicine and politics do not mix." Such reports a magazine that should speak with authority—the *British Medical Journal*.

Britain has had socialized medicine for many years and her National Health Service employs something like 99 per cent of all British doctors.

The service's current troubles have been in the news considerably lately with the most publicized issue being doctors' pay. Such pay is reportedly extremely low by any reasonable standard.

There does, however, appear to be even more to the matter than the economic issue.

As the medical journal puts it, "The employes have lost all trust and confidence in their monopoly employer." As evidence, it points to the fact that in recent months there has been a striking increase in the number of doctors investigating the possibility of leaving England for one of the Dominions.

What are the troubles, other than the salary problem, that socialized medicine has brought to Britain's doctors: The *Journal* has this to say: "The pettifogging arguments about whether a food is a drug, the form-filling, the regulations, earnest discussions on whether a week's leave not taken one year can be carried on to the next, ever-increasing intrusion of the administrator centrally and locally—all this and much more is turning medicine into an administrator's maze. . . ."

The *Journal* then makes the most ominous statement of all, "The unfortunate doctor soon loses his sense of direction and will end up by losing his sense of profession."

Measures are periodically proposed in this country

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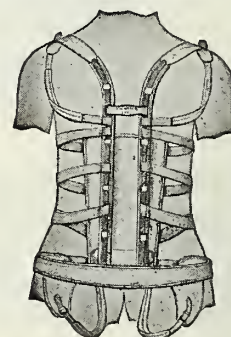
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This statement was part of Recommended Benefits of Prepaid Hospitalization Plans, a guide published in the August 16 issue of *Hospitals, Journal of the American Hospital Association*. The document points out that "there are groups for which it is difficult to make benefits sufficiently inclusive, and certain health services which are not generally available."

The guide urges prepaid health care plans to "encourage the use of outpatient facilities, long-term care facilities, and home care programs when necessary health care can be provided in or through such facilities at less cost than inpatient care in a general or special short-term hospital."

It observes that "While payment for necessary health care is primarily the responsibility of the individual or the family unit, government and the community have a legitimate responsibility to provide or to assist in paying for necessary health care for those people who are unable to finance it themselves."

Necessary health care is defined as "the total diagnostic and treatment services made available through hospitals and related institutions, which are

required for the proper care of acute and prolonged illness." The guide says, "Such health care should be made available for as long as the responsible physician may prescribe in accordance with sound medical practice."

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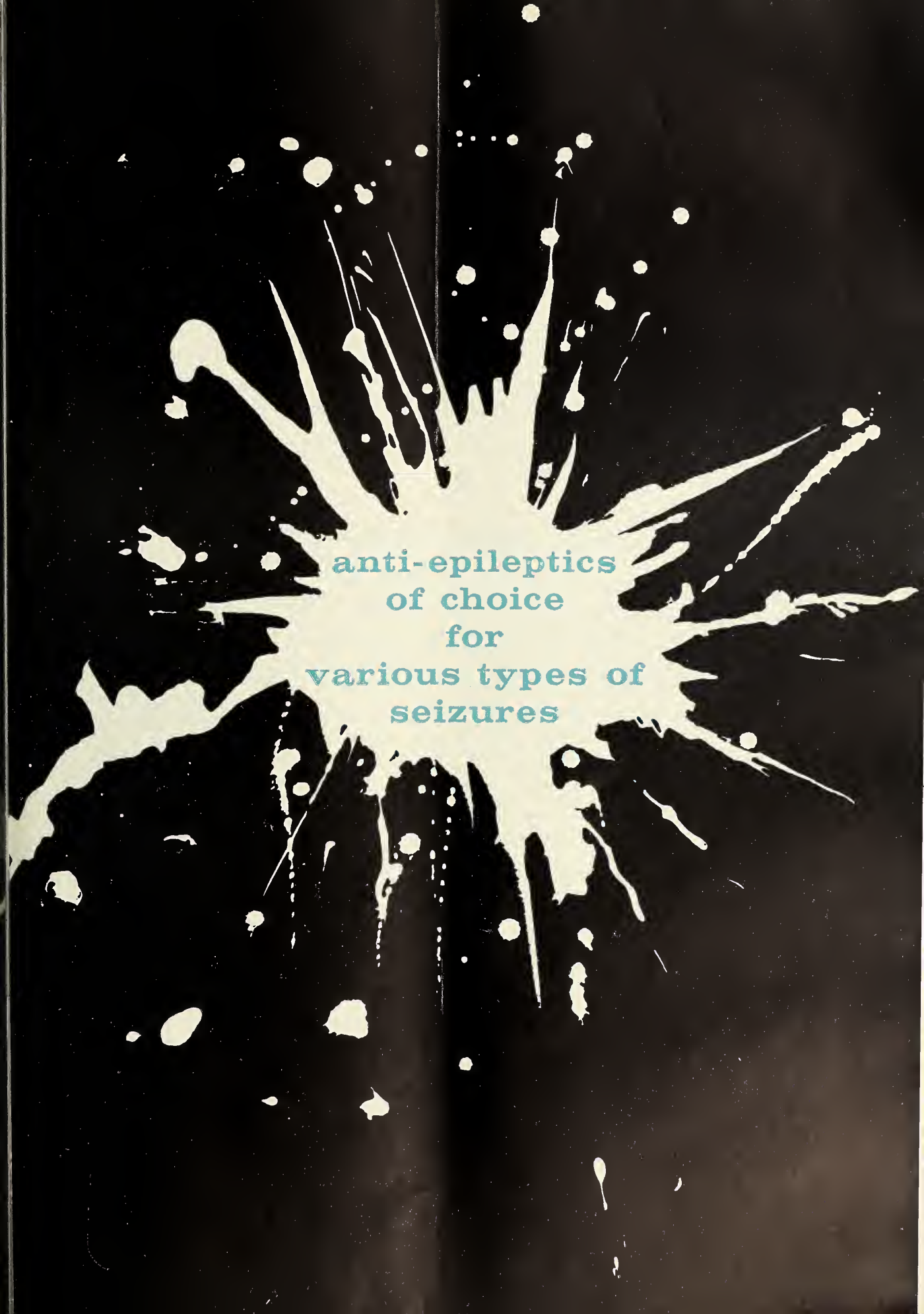


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Volume LVIII

OCTOBER, 1957

Number 10

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Volume LVIII

OCTOBER, 1957

No. 10

Therapeutic Syndromes

Are Doctors Outsmarting Themselves Therapeutically?

JESSE D. RISING, M.D., *Kansas City*

"Man is the only creature that is capable of disliking the creation . . . in his ardor to reform and recolor what is intrinsically not so good, he tends to overlook what is intrinsically not so bad."¹

He "is the one creature who can significantly alter himself and his environment to suit his private tastes . . . who can know very much about himself . . . who can dodge many harsh and dangerous exactions of Nature only to run foul of harsh and dangerous devices of his own manufacture."²

"When Nature gave him a brain and with it the unprecedented privilege of contributing to the arrangement of his own life, she included the less enviable capacity of suffering for his own mistakes."³

Man's tampering with the balance of nature—even with the best of intentions—has very commonly led to unhappy results: English sparrows were imported to save the elms from measuring worms only to upset avian ecology and displace many songbirds. Mongooses were brought into Jamaica for the purpose of controlling the rats which took a toll of the local agriculture, only to have the "saviours," when they ran out of rats, turn upon birds, lizards, and other small animals that contributed to the control of insects with the result that a host of destructive insects was unleashed to devastate the crops.

Physicians and engineers have contributed their share to the imbalance of nature and have made it possible for vast numbers of human creatures to inhabit this planet, often in dense concentrations. In recent years physicians have even found it possible to apply specific therapy to the cure of disease—not only preventive and palliative measures—but the ef-

fect has not invariably been salubrious, and it has developed that the cure may not always be an unmixed blessing but may, indeed, be worse than the disease.

It would perhaps be out of place to discuss at this juncture the ethics and philosophy of the physician's interference with natural processes and the balance of nature. Perhaps, from our present standpoint, it would be appropriate, on the other hand, to pause and review some of the basic philosophy of therapeutics. We must always keep uppermost in our minds the fact that any medication is a calculated risk and must be viewed as no better than the lesser of two evils. The present trend seems to be for scientists to accumulate facts faster than understanding. This is probably inevitable, but we are under an obligation to exert every effort to bringing understanding as near abreast the facts as possible.

In addition, we must recognize the effects of medicine on human genetics, realizing that "the long-term influence of our modern advances in medicine and of all our artificial aids to life must gradually decrease the biological fitness of the population. This happens by the ever increasing accumulation of all sorts of mutations that, under more severe conditions, would have been eliminated. Since new mutations keep occurring in every generation and

Presented at the annual meeting, Kansas Chapter, American Academy of General Practice, Wichita, May 6, 1957.

are thereafter handed down unless some descendant dies of his disability, these mutations will tend to accumulate until the population is bearing as great a load of them as can be kept alive by its greatly enlarged cohorts of doctors, exercising their best medical skill and working overtime. Moreover, the more we add to the naturally occurring mutations by producing others by means of atomic radiation or medical x-rays, the sooner this eventuality will materialize."⁴

It is imperative that physicians remember that even the best medicine, under the best circumstances, is at best the lesser of two evils. We all recognize, of course, that drugs have toxic actions and physiologic side effects; these are often predictable on the basis of the pharmacologic actions of the drug or as hypersensitivity reactions. Of increasing interest in recent years are reactions that cannot, in our present state of knowledge, be placed in either of these groups. These reactions present the appearance of actual disease states, mimicking or reproducing with variable degrees of accuracy diseases which have been known for some time. The following are a few that have, without any effort to search the literature, come to the attention of one general practitioner pursuing, not too diligently I fear, the journals which an average physician might be expected to have available even in a rural office.

Hydralazine (*Apresoline*)

Perhaps the most interesting example of this situation is what is sometimes called the hydralazine syndrome. This is in reality two diseases—or appears to be so—the first being rather typical rheumatoid arthritis complete with all of the expected laboratory findings. The more severe form, and the more dramatic one, is less common and is, to all intents and purposes, identical with acute disseminated lupus erythematosus, including the presence of a biologic false-positive reaction for syphilis and positive lupus erythematosus cell preparations.⁵⁻¹⁰ The only apparent difference between typical acute disseminated lupus and the severe form of hydralazine syndrome is the fact that patients usually get better immediately when the drug is discontinued, but this is not invariably true as some patients have required treatment with ACTH and cortisone.

This syndrome can apparently be produced with great efficiency if one really puts his mind to the job. It seems that we can expect to produce hydralazine syndrome in 8 to 10 per cent of patients who are treated intensively for several months.

Adrenal Cortical Hormones

Typical peptic ulcers are so commonly produced by cortisone, hydrocortisone, prednisone, and pred-

nisolone that manufacturers have recently begun to incorporate antacids in preparation of some of these hormones. Incidentally, this is a pharmacologically irrational approach to the problem which undoubtedly tends to give the physician a false sense of security without materially affecting the incidence of the complication, and it is therefore to be deplored.

The outstanding atypical feature of this type of peptic ulcer is that it is frequently asymptomatic until the patient develops a massive hemorrhage or perforation. The perforation may actually cause relatively few symptoms, and the patient may have extensive peritonitis before there are indications of illness. This is indeed a high price to pay for the benefits to be derived from the treatment, especially if the condition calling for use of the hormone be a relatively benign one, as is often the case.¹¹

Euphoria is often one of the outstanding results of corticoid therapy and would be a welcome one in many instances were it not for the fact that it indicates affective changes which may, and not infrequently do, lead to frank psychotic reactions, mimicking the well-known manic-depressive psychoses. The psychosis may be characterized by elation or mania on one hand or severe depression or melancholia on the other. Some patients have been reported to develop typical schizophrenic behavior patterns while under corticoid therapy.

More than a few patients have had typical grand mal epilepsy while being treated with corticoids, and, while patients with abnormal electroencephalographic patterns seem to be more frequent victims of this type of reaction, a normal electroencephalogram is no guarantee that the patient will escape. Grand mal seizures seem to be especially frequent among children.^{11, 12}

Corticoids are commonly used in the treatment of arthritic conditions, and one must constantly be alert to the fact that the hormones are prone to cause osteoporosis. This complication can most often be expected in elderly individuals and may materially contribute to the worsening of their orthopedic problems. The weakening of the bones may even go so far as to produce spontaneous fractures in postmenopausal women.

A source of trouble that has often been overlooked is the shortening of coagulation time in patients who are on corticoid therapy, but reports indicate that there is a high incidence of thromboembolism, including pulmonary embolism, in patients being treated with adrenal cortical steroids.^{13, 14}

Reserpine and Rauwolfia Products

Even the youngest practitioner of medicine must certainly remember when Rauwolfia and its products were introduced as extremely safe, if somewhat

mild, antihypertensive drugs. At that time it was recognized that these drugs had ataractic or tranquilizing properties, and the literature was full of suggestions that here at last was an extremely safe calmative agent to take the place of phenobarbital. I sincerely hope that no practitioner now holds this prejudice, for it is certain that reserpine is one of the most dangerous of the tranquilizers—so dangerous that it has really very few indications.

Soon after introduction of the drug into human therapeutics, it was recognized that the incidence of peptic ulcer in patients under treatment with it was far in excess of what one could reasonably expect on the basis of chance. The pharmacology of the drug would, indeed, lead one to expect that this complication might result, for it has almost precisely the opposite effects of vagotomy. We now know from human and animal experiments that both oral and parenteral reserpine increase secretion of gastric acid, and there seems to be little doubt that the drug can precipitate peptic ulcers.¹⁵

Psychic depression is a relatively common side effect of reserpine therapy, and the literature is burdened with reports of severe psychotic reactions. Most of them resemble the depressive phase of manic-depressive psychosis, but some are characterized by agitation or paranoia with suicidal tendencies. Numerous suicides have been reported, and many physicians have knowledge of unreported cases. We can only speculate about the frequency of severe psychologic reactions, but when one considers the documented incidence of major psychoses and less severe emotional reactions as compared with the drug's inefficiency as an antihypertensive agent, one is reluctant to accept it as a routine medication for treatment of hypertension.^{16, 17, 18}

In addition to this we are presented with reports of edema and congestive heart failure being precipitated by reserpine (and alseroxylon) in patients with hypertension but without a previous history of decompensation. These patients developed ankle edema shortly after institution of therapy, and some developed exertional dyspnea and basilar rales. The other disturbing feature is that only one patient in five had significant lowering of blood pressure. None of the patients improved until the drug was discontinued, but all responded promptly after it was withdrawn.¹⁹

To make matters worse, we have evidence that *Rauwolfia* can apparently be blamed for production of ventricular premature contractions in patients with organic heart disease and high blood pressure.²⁰

Mecamylamine (*Inversine*)

The quest for drugs useful in treatment of hypertension goes on, and it is not surprising that gan-

glionic blocking agents are being explored extensively. One of the promising new drugs is mecamylamine which, because it is a secondary rather than a quaternary amine, penetrates cells more efficiently than the other ganglionic blocking agents and is consistently and completely absorbed from the gastrointestinal tract. The improved absorption would be a great boon, but it has been postulated that the very feature responsible for this pharmacologic triumph may permit the drug to enter cells in the central nervous system with something less than happy results.

Many patients have been observed to develop neurotic reactions characterized by anxiety or depression (or a mixture of these symptom complexes) as a result of mecamylamine therapy. Patients more severely affected have developed a neurological reaction that is reminiscent of chorea. Some have had jerking and intention tremor and have impressed observers as having a condition similar to Huntington's chorea, while others have had queer, purposeless, irregular movements of the extremities, face, and body which are more characteristic of Sydenham's chorea. Slurred speech, dysphagia, and dysarthria have been reported, and it must be difficult, when these symptoms are combined with intention tremor, to differentiate the condition from multiple sclerosis. In addition, some patients have exhibited grand mal epilepsy.²¹

There is a probability that mecamylamine can produce a major psychosis in addition to the neurotic and motor reactions noted above.²²

Hexamethonium

No one who has used ganglionic blocking agents in the treatment of severe hypertension has been impressed by the benign nature of these drugs, but one interesting reaction has received relatively little attention: a number of patients with severe hypertensive disease treated with hexamethonium (with or without hydralazine) have developed an unexplained type of dyspnea with pulmonary changes likened to the Hamman-Rich syndrome.

This condition is characterized by a sudden onset of dyspnea, cyanosis, fever, cough, and chest pain; it may progress to death in one month. There is no certain knowledge of the cause of this reaction, but the lesions are thought to be the result either of attacks of left ventricular failure modified by intermittent hypotension or of a pulmonary collagen disease. Pathologically there is acute diffuse interstitial pulmonary fibrosis which is identical with the changes present in patients having the Hamman-Rich syndrome and which resembles pulmonary scleroderma.^{23, 24}

Acetazolamide (*Diamox*)

Acetazolamide is a mild diuretic which is frequently given to cardiac patients in order to decrease their requirements for the more potent mercurial diuretics. It is an inhibitor of carbonic anhydrase which normally makes hydrogen ions available for exchange with sodium ions in the glomerular filtrate and for the formation of ammonium ions from ammonia by the renal tubular cells. It is well known that patients receiving acetazolamide with ammonium chloride may develop severe acidosis because of their inability to excrete the excess chloride ion. There is evidence that patients with severe congestive heart failure and chronic congestion of the liver are apt to develop ammonia intoxication spontaneously, and both ammonium chloride and acetazolamide have been implicated as etiologic factors in the precipitation of hepatic coma in patients with severe congestion of the liver caused by cardiac decompensation.²⁵

Chlorpromazine (*Thorazine*)

The phenothiazine tranquilizers, which include chlorpromazine (*Thorazine*), promazine (*Sparine*) and prochlorperazine (*Compazine*), have so many pharmacologic actions that it is surprising that they do not cause more undesired side effects than they do. Pertinent to our present discussion is the fact that these drugs quite frequently cause an extrapyramidal syndrome which is similar to, if not identical with, Parkinsonism with generalized cogwheeling, rigidity, tremor, pill-rolling motion of the fingers, mask facies, skin changes, attitude of flexion, gait disturbances, drooling, and poverty of movement. Such reactions occur occasionally when the drugs are used in modest dosage, and the incidence approaches 50 per cent when high dosages are employed. The symptoms subside rather slowly after the drug is stopped, and they may persist for two or three months.²⁶

By now everyone knows that chlorpromazine can cause jaundice, but the erroneous notion is prevalent that this jaundice is invariably benign and of an obstructive nature. We now know that hepatocellular damage is not infrequent,²⁷ and that rather severe jaundice has been reported to follow a single relatively small dose of the drug.²⁸ Indeed, there is good evidence that chlorpromazine can cause clinical hepatitis in the absence of icterus (anicteric hepatitis).²⁹

Cycloserine

One of the newer antibiotics which shows promise of being helpful in treatment of patients with intractable tuberculosis is cycloserine. Dosage of this drug has to be regulated carefully, as slightly more

than the minimal effective dose precipitates grand mal seizures in a high percentage of patients. Electroencephalograms have not been helpful in predicting which patients can be expected to have epileptiform seizures. In addition to the "epilepsy," neurotic, psychotic, and personality changes have been reported. The drug is especially dangerous for patients who have diminished kidney function because it is excreted by the kidneys, and renal damage leads to its retention in toxic amounts.³⁰

Antibiotics

Various antibiotics have been responsible not only for control of numerous serious infections but for the whole spectrum of garden variety drug reactions. In line with our present discussion, one is outstanding. Pseudomembranous enterocolitis has been a recognized entity for many years, cases of which have been reported in the literature from time to time, but, with the advent of antibiotic therapy—specifically therapy with agents which destroy the normal intestinal flora—there have been numerous instances of the appearance of this malignant condition. It is impossible to estimate how many patients have lost their lives as the result of a disease which is essentially iatrogenic.^{31, 32}

Isoniazid

One of the most important agents used in the treatment of tuberculosis is isoniazid. Shortly after it was introduced there were reports of euphoria and psychotic reactions, but it now appears that the euphoria is directly related to the actual clinical improvement of the patient, and psychotic reactions do not occur in a discernible cause and effect relationship with the drug. However, one complication of importance has been reported, namely a fairly typical peripheral neuropathy. This complication evidently bears a relationship to the dosage of the drug employed and apparently affects adults exclusively. Symptoms are paresthesias, numbness, burning pain, weakness, etc., and signs include hypesthesia and exaggerated or absent deep tendon reflexes. This neuropathy resembles the natural and experimental neuritis which is caused by pyridoxine deficiency, and the consensus now is that isoniazid functions as an antimetabolite against pyridoxine. The early neuritis does indeed respond to pyridoxine therapy, but if it is permitted to progress it tends to become permanent.³³

Iron

Our attention has understandably been directed toward the newer therapeutic agents, but some of the old standbys must also be held responsible for

iatrogenic syndromes. Everyone is cognizant of the minor gastrointestinal disturbances that so frequently accompany iron therapy and of the severe, fatal reactions that result from acute overdosage of iron salts. Chronic toxicity must not actually be a great hazard or we should have heard more of it, but one cannot afford to forget that hemochromatosis, or a similar entity, is associated with increased iron absorption. This is probably at times more than a simple hemosiderosis, and it must be considered when one embarks upon the long-term treatment of patients with "refractory" anemia.

Conclusion

"Man is a prober and meddler, and in this, so long as he holds true to his own gifts, he will not stop."³⁴ Perhaps "a little knowledge is a dangerous thing" but "very few of those who have followed the history of medicine, from the first trepanning operation to the modern transplantation of the cornea, would agree that we should have abandoned medicine because at each stage in its history first attempts at operations have been unsuccessful. A little learning, if it is the first learning, is the way in which men move on to new knowledge, and it can be regarded as dangerous only when the practitioner or patient overestimates it. . . . Learning is not dangerous because there is only a little of it, but it is dangerous not to know just how little there is."³⁵

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If there is one thing which I have learned as a result of four years at the United Nations it is that the sense of justice is very much the same in every man. Regardless of whether he comes from Asia, Africa, Europe or America, he has very much the same idea of fair play as his fellow man who may come from a country 10,000 miles away. . . . The future of the world depends on the extent to which we can base international relations on that sense of justice and fair play which is in every human heart.

—Henry Cabot Lodge

Ataractics

A Study of the Current Status of Tranquilizing Drugs

PAUL E. FELDMAN, M.D., *Topeka*

My opening remarks might be considered as "signs of our time," as, for instance, a chain drug-store advertisement which read:

Relax with Tranquil
SALE
Tranquilizing Tablets
NO PRESCRIPTION NEEDED

Or perhaps you may have seen in the February 1957 issue of *Better Homes and Gardens* in the department entitled "Your Pet and Mine," edited by Veterinarian Wayne H. Riser, a problem sent in by a subscriber who stated: "My dog becomes afraid and very excited during a thunderstorm. Is there a drug that he could be given to calm him?" Answer by Dr. Riser: "Many drugs have been tried for this fear of storms. Until recently, none has been successful. However, the new drug Thorazine has been reported to give good results. Discuss this with your veterinarian and ask him what his results with the drug have been."

In our general hospitals Thorazine and other tranquilizers are now routinely prescribed preoperatively to allay operating room anxiety. Spirits of ammonia are being replaced in our funeral parlors by Miltown.

A recent "Grin and Bear It" cartoon depicts a harassed school teacher sitting at her desk in front of a rowdy class with a bottle of pills on her desk and the school principal saying to her, "Tranquilizing pills have no place in the teaching profession, Miss Figby! Next, you'll be taking a drink."

From bits of information like this we begin to realize how commonplace these drugs have become—how much they are now a new and vital characteristic of our type of society.

It is reported that women get together for an afternoon of bridge or tea and the hostess passes around a bottle of Miltown. At some of these affairs tranquilizing tablets are passed out by the handful. If you can't get them on prescription, there is an ample black market where you can buy them at a considerably marked up price.

The old time needle-beer parties and the more recent marihuana parties are being replaced by mescaline or lysergic acid diethylamide parties. The participants ingest some type of hallucinogen and, when

they wish to terminate the experience, they use a blocking agent which is usually one of the new tranquilizing drugs.

In many ways, all sorts of people are taking these drugs for "kicks," and the drugs have acquired the title of "happiness pills."

I don't believe that I am exaggerating the present situation. There are surveys, fantastic as they may seem, which indicate that millions and millions of tranquilizer tablets are being ingested daily. A medical survey last year indicated that from four to six of every 10 prescriptions were being written for some form of tranquilizer.

If this is true, and I don't doubt it for one minute—if proper, accepted medical practice is based upon what the majority of the profession do, then I have to conclude that the promiscuous prescribing of tranquilizers is a proper and ethical practice.

The development of tranquilizers has made possible a new and effective treatment regime in many mental hospitals and has helped increase discharge rates. It has awakened public interest in problems of mental health. However, the indiscriminate use of tranquilizers is fraught with many dangers, some of which are outlined here.

It is true that all of us do not see eye-to-eye about the efficacy of these drugs, and there is a substantial number of sincere opponents to this practice. There are many ethical, competent psychiatrists and general practitioners who never prescribe tranquilizers, yet appear successful in their management of emotional and nervous disturbances.

The entire field of tranquilizers and tranquility has been considered under the term "ataraxis." Fabing of Cincinnati who introduced the term, borrowed it from the Greek word "ataraxia" which means "freedom from disturbance of mind and passion." Some anonymous wit has defined ataractic drugs as "don't give a damn pills."

Psychopharmacotherapy—the treatment of mental illness with drugs—is probably as old as medicine itself; but in a more limited sense, ataraxic therapy was ushered in about the time of World War II with the development of narcoanalysis. The effects

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of intravenous sodium amytol upon catatonia and the general effects of abreaction upon mental symptoms stimulated investigators to look for new and more effective drugs which might be used in the treatment of mental disease.

One of the first new drugs to appear was mephenesin which was marketed by Squibb under the trade name of Tolserol. During the period that this drug was tested experimentally, it was found to be effective in the treatment of everything from delirium tremens to senile dementia. And then, as often happens with an experimental drug, the charm wore off and it was found to be about as effective as tap water for these same states. Even today though, it still has slight merit as a muscle relaxant, provided you use adequate dosage.

In fact, this particular property of mephenesin, its muscle relaxant property, stimulated investigators to look for a drug which had a more prolonged mephenesin effect, and the result of this search culminated in what we today know as Miltown or Equanil. Miltown is a mephenesin-like drug with a more prolonged muscle relaxant effect.

Since the introduction of Tolserol, a number of newer products have appeared. Interest in rauwolfia led Ciba to market this alkaloid under the trade name of Serpasil, and soon other pharmaceutical houses followed suit using the generic name of reserpine.

At about the same time, investigators seeking a superior antihistaminic, attempted by starting with the mother-substance "Phenergan" to arrive at a product which had the antihistaminic properties of Phenergan without its toxic effects. Their search culminated in the development of Largactil which is chlorpromazine hydrochloride, which Smith, Kline and French patented in this country under the trade name of Thorazine.

In rapid succession have appeared Frenquel, Meratran, Ritalin, Sparine, Compazine, Suavitil, Atarax, Pacatal, Trifalon, Vesprin and a host of numbered, experimental products.

These drugs can be roughly divided into two groups: (1) the central nervous system stimulants as exemplified by Meratran and Ritalin and (2) the tranquilizers as exemplified by reserpine and Thorazine.

We are aware of a number of physiological differences between these drugs, but with minor exceptions our present state of ignorance does not permit us to ascribe any specificity to any of them as yet. Frenquel, for instance, is supposed, according to William S. Merrell Company, to be a specific for hallucinations and postoperative confusion, but there is ample scientific literature to refute this claim.

Meratran, Ritalin, and other central nervous system stimulants have been found by some investigators

to be effective in the treatment of endogenous depressions. True as this may be, it is questionable whether it is a form of treatment for depression superior to some of our more firmly established therapies. Clinically there are more contraindications to the administration of amphetamine-like drugs than there are to electro-convulsive therapy.

In spite of the discrepancies in the literature, there are a few generalizations about ataraxic drugs which, all agree, do apply:

1. All of them do something, some more than others, but none are inert substances.

2. Their mode of operation and fate in the body are obscure. Pharmacological studies have shown that some drug is eliminated in the urine, some detoxified by the liver, and some deposited in the brain, but as yet we are unable to account for the major portion of the drug.

3. None of these drugs are completely non-toxic.

4. There is absolutely no evidence to indicate that these drugs alter basic personality patterns. They manifest their beneficial effects by diminishing tension, anxiety, and hyperactivity.

5. Therapeutic effectiveness is dependent upon individualizing the dosage. What may be an adequate dosage for one patient, may be completely inadequate for another, even though both patients might exhibit identical clinical symptoms.

6. Evidence appears to be overwhelming that these drugs are:

- a. Strikingly effective in relieving excitements, agitation, anxiety, and confusion.

- b. Apparently effective in alleviating hallucinations and delusions, especially in paranoid patients.

- c. Helpful in reducing hyperactivity in mental defectives, thus enhancing their performance.

- d. Helpful in relieving tremors and tensions of cerebral palsied children.

- e. More effective in hospitalized patients than in outpatients.

- f. Effective for the tension, apprehension, and tremor of the alcoholic.

- g. Reducing the use of prefrontal lobotomy and electro-convulsive therapy.

- h. Of uncertain value in the treatment of depression and have in many instances induced exacerbation of depression.

Individual claims of cures can be found in the literature, but most proponents as well as opponents of ataraxis feel that other than for improvement in certain symptomological aspects of mental illness, nothing more should be expected from these drugs. Most men who employ ataraxis use these drugs as only one aspect of a total treatment program.

Since these drugs then, at best, merely mask symp-

toms, unless some more effective therapeutic measure is employed concurrently, there is little likelihood that the underlying factors which caused symptoms will be altered, and these drugs will have to be administered indefinitely. Upon their discontinuance there will usually be a recurrence or exacerbation of symptoms. This is being borne out by the two-, three-, and four-year follow-up studies which are beginning to appear in the literature.

In our own studies, two-thirds of the patients who have been released on tranquilizer therapy are still taking medication. Of the remaining third, most, after stopping medication, have found their way back into the hospital. In long term treatment, the maintenance dosage is substantially below the original therapeutic level, but complete cessation of medication leads to an exacerbation of symptoms.

One of the major drawbacks to tranquilizer therapy is the untoward harmful effects produced by them. None are completely harmless, not even Miltown which is popularly thought to be completely non-toxic. There are numerous reports of addiction or convulsions with this supposedly harmless drug.

The major complications of ataraxis are those associated with blood changes, hepatic dysfunction, the development of a convulsive diathesis, the results of inadequate dosage during the incipient phase of a major psychotic state, the development of depression, and failure of the air-passageway defenses.

To date there have been approximately 50 cases of agranulocytic angina reported in the literature. Of these, about 10 to 15 per cent have terminated fatally in spite of heroic measures. Various investigators quote an incidence rate of from 1:1,500 to 1:15,000. It is my personal conviction that if all cases of agranulocytosis, fatal and non-fatal, were reported, we would find an incidence of about 1:300.

The potential development of this dreaded complication must be kept in mind at all times, and it is one of the major reasons for considering ataraxic therapy a serious medical procedure which at all times must be under the supervision of a physician. If you rely upon the usual monthly blood studies to forewarn you of an impending agranulocytosis, it will only lead to disaster. It is far better to place your reliance upon your clinical estimate of the patient and if one or more of the triad of symptoms appear [(1) fever of undetermined origin, (2) sore throat or (3) lesions of mucous membranes] discontinue medication at once and treat as an agranulocytosis until proven otherwise.

The usual disturbances of hepatic function are those associated with intrahepatic biliary obstruction. It may occur in about 1 per cent of patients, and there is division of opinion as to how it should be

managed. When jaundice appears, some discontinue medication, others do not, and all seem to have about equal success in the management of this complication.

Most reports suggest that jaundice occurs within the first 30 to 60 days of medication and that it is not related to dosage size, but is more in the nature of an allergic response or a Herxheimer reaction. Another theory suggests that as a result of intestinal hypomobility, there may be blockage at the choleloduodenal sphincter with consequent biliary stasis and intrahepatic obstruction.

There are reports of cases of jaundice which have occurred many months after tranquilizer therapy was started, but in every case I have been able to follow I have found that medication had been interrupted and that jaundice appeared 30 to 60 days after medication was reinstituted.

Clinically you might have great difficulty distinguishing between Thorazine jaundice, an infectious hepatitis, or a gallstone syndrome. I have seen autopsies upon patients who had at some previous time had Thorazine jaundice, and gallstones were demonstrated.

Another hepatic complication of tranquilizer therapy is just becoming apparent as a result of multiple-year follow-up studies in which a high incidence of pathological obesity and fatty degeneration of the liver is being reported. We are also becoming aware of non-icteric hepatitis associated with pain in the upper right abdominal quadrant. Recently there have been reports of pain in the lower right abdominal quadrant, due to muscle spasticity and closely resembling acute appendicitis.

If a patient without a previous history of seizures should develop convulsions during the course of tranquilizer therapy, such an occurrence must be regarded as a major complication. The unexpected appearance of convulsions indicates a serious disturbance of brain function and metabolism. Should seizures develop, they must be assessed in the light of the psychiatric gain made as a result of therapy; if it is felt that the improvement in symptomatology warrants it, seizures can be quite successfully controlled by the use of some anti-convulsant such as Dilantin.

Some of the drugs, notably the reserpine products, are known to produce depressions of serious magnitude. The appearance of suicidal trends is a major complication of therapy.

The administration of an inadequate dosage of drug during the incipient phase of a major psychosis may permit a full blown psychosis to appear which might have been avoided or ameliorated by more adequate measures. I do not mean to imply that all mental disturbances, regardless of severity, should

be referred to the psychiatrist. There are too few to go around, and in addition minor neuroses and other related emotional disturbances rightfully belong in the domain of the practitioner. I only remind you that sometimes the incipient phase of a major break may be ushered in by what may appear as minor symptoms. It is at this phase of the illness that the most good can be done therapeutically with proper measures.

I cannot help but be impressed by the number of acutely and severely psychotic patients who are finding their way into our mental hospitals. They reach hospitals late as far as the optimal time for appropriate treatment is concerned, and we obtain a history of their having been treated with 10 or 25 mg. of Thorazine per day for long periods of time.

I would like to mention one additional major complication, the nature of which as yet is obscure. Some investigators are reporting a high incidence of pneumonitis during tranquilizer therapy, and recently there have been reports of deaths which were due to aspiration strangulation. In these cases there appears to have been a catastrophic failure of the air-passageway defenses to respond to the presence of foreign material in the trachea.

There seems to be an almost infinite variety of minor untoward effects of tranquilizer therapy, a few of which are:

Drowsiness

Dizziness

Parkinsonism and a variety of extrapyramidal symptoms

Allergic phenomena

Disturbances of vision

Corneal ulcerations

Potentiating action on sedatives, hypnotics, and narcotics

Hypotensive responses, especially orthostatic type

Gastrointestinal disorders including reactivation of previously dormant ulcers

Increased incidence of infectious processes.

These minor side reactions may occur in a variety of combinations and are more marked and frequent with some drugs than with others. Every one of the

minor side reactions listed can be managed by (1) administration of proper antagonistic medication, (2) lowering dosage of ataraxic drug, or (3) discontinuation or change of medication.

Perhaps one of the most significant advances in ataraxic therapy during the past year has been the development of an appreciation that these untoward effects are inevitable and perhaps not necessarily undesirable or detrimental, also, that these patients can be kept comfortable and active by the suitable management of side reactions.

Fabing, who coined the term ataraxis, has facetiously fantasied that "an enemy may drop a ton of ataractic drug into the water supply of our major cities and then march triumphantly through our streets while we sit in a rocking chair at the window, not lifting a finger in our defense because we are too listless and inwardly peaceful to get up on our feet and fight for our freedom."

There are also some good effects of the tranquilizers which even the opponents of ataraxis agree upon. The development of tranquilizer drugs has been a shot-in-the-arm for psychiatry in general. It has awakened tremendous public interest in problems of mental health, our state hospitals, and related agencies. It has stimulated research, not only in the field of ataraxis but in related fields as well. It has hastened the investigation of the experimental psychosis and the role of serotonin in mental health and in disease.

In some of our state hospitals where inadequate staffing prevented a modern therapeutic program, it has made possible a treatment regime to which thousands and thousands of patients have responded. In some areas of this country it has resulted in significant increases in discharge rates from state hospitals and in a substantial reduction in seclusion and restraint rates.

Within the past few weeks both the Food and Drug Administration and the New York Academy of Medicine have issued statements condemning the indiscriminate use of tranquilizers by both the layman and the medical profession.

Topeka State Hospital
Topeka, Kansas

Wonder is the beginning of wisdom in learning from books as well as from nature. If you never ask yourself any questions about the meaning of a passage, you cannot expect the book to give you any insight you do not already possess.

—Mortimer Adler

Carcinoma of the Prostate

A Review of Symptoms, Diagnosis, and Prognosis

W. A. ROLL, M.D., *Halstead*

When one is considering diseases which afflict the aged, carcinoma of the prostate stands high on the list. Incidence of carcinoma of the prostate is more frequent than that of any other cancer in the male, and this lead is likely to grow as the average age increases.

There are many studies to show increasing incidence with increasing age. Hudson found prostatic cancer in 13 per cent of men above 50 years of age subjected to perineal biopsy. Moore found at autopsy that 20 per cent of men over 40 years of age had prostatic malignancy. Only one cancer out of five was clinically manifest. These studies show the prevalence of this disease and indicate that it is a problem which deserves the attention of every practicing physician.

The etiology is as yet unknown. We know that eunuchs do not have cancer of the prostate. We infer from this that testosterone stimulation is necessary for malignancy to develop in the gland. However, we must remember that carcinoma develops when the estrogen-androgen balance is being tipped in favor of estrogen. It is at a time when atrophic changes are occurring in the prostate. Moore believes that most, if not all, carcinomas of the prostate originate from atrophic acini. This may explain why most carcinomas arise in the posterior lobe since this lobe shows more atrophy and never participates in hypertrophy as the other lobes may do.

Almost all malignancy originating in the prostate is adenocarcinoma. This varies from anaplastic to well differentiated growths which can be identified only by an expert pathologist. The diagnosis depends on the presence of anaplasia, loss of orientation, invasion of perineural lymphatics, and changes in staining properties. Figures 1 and 2 are examples of a well differentiated carcinoma and an anaplastic carcinoma. About three per cent of prostatic cancers are of the squamous cell variety.

The disease process apparently remains localized for prolonged periods of time, and at present we do not know how many latent carcinomas actually become clinically manifest. When spread occurs, it takes place by local extension and by both hematogenous and lymphogenous routes. The first distant spread is to the internal and external iliac lymph

nodes. The bones of the pelvic girdle are also commonly involved with metastases. Seeding of the lumbar spine may well occur via the venous plexus of Batson.

The most common symptoms are those due to urinary obstruction such as urgency, frequency, and dysuria. These may be due to an associated prostatic hypertrophy. Hematuria also is a common finding and usually signifies invasion of the bladder or

Carcinoma of the prostate is the most common malignancy in men. Treatment by radical excision is curative if the diagnosis is made early enough. Estrogens may be used for palliative treatment.



Figure 1. Photomicrograph of well differentiated adenocarcinoma of the prostate.

From the Department of Urology, Hertzler Clinic and Hertzler Research Foundation, Halstead.

urethra by tumor. Initial symptoms can be due to the metastases and consist of any of a large variety of phenomena, depending on the organ affected. Backache, anemia, weight loss, and general malaise are among the more common ones.

Early carcinoma causes no symptoms whatsoever, and it is usually found during a routine examination. It is first detected as a firm or hard nodule in the posterior or lateral lobes of the prostate. Later, as the cancer grows, the entire gland becomes fixed to the surrounding tissues and typically feels stony hard and nodular. The bones may be affected by either osteoblastic or osteolytic types of metastases. The acid phosphatase will be elevated in 80 per cent of cases with bony involvement.

Diagnosis of far advanced cases usually is easy; however, in early or questionable cases a biopsy must be obtained. This is particularly important when the disease is apparently confined to the prostate. Every nodule found in the prostate should be considered malignant until proved otherwise. The series reported by Jewett and that by Kimbrough show that 50 per cent of solitary prostatic nodules are malignant. We have found this to be true in our own series of patients.

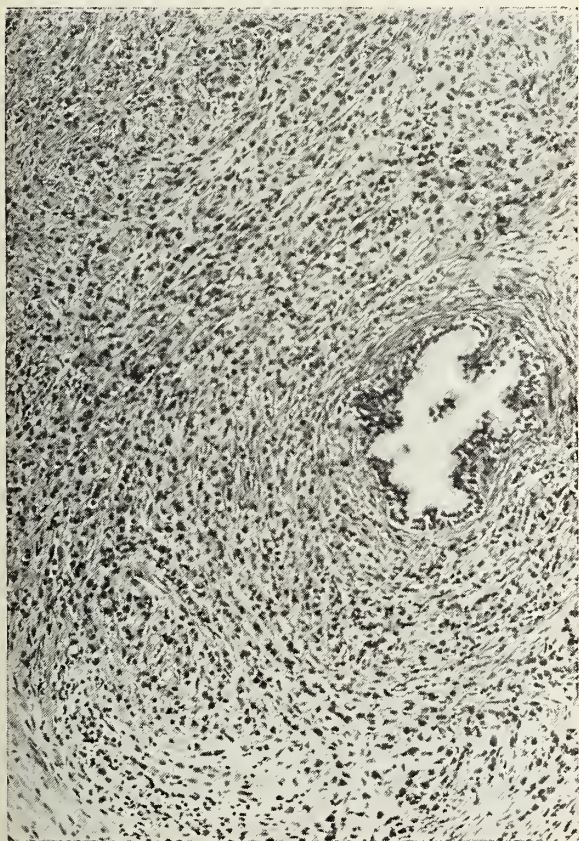


Figure 2. Photomicrograph of anaplastic carcinoma of the prostate.

The biopsy can be obtained either by transperineal or transrectal exposure. Some men have had success with a needle biopsy, but it is difficult when only a small nodule is present and is reliable only when positive. The transurethral method of biopsy is not satisfactory in early malignancies because the tumor arises in the periphery of the gland and tissue may not be obtained from it.

Various other tests can be performed such as the determination of the acid phosphatase content of the prostatic secretion or examination of the secretion for malignant cells. Still other tests on the blood and urine are being developed but are not yet reliable. We must still depend on microscopic examination of the tissue.

Treatment is either curative or palliative and depends upon the state of the disease when first found. The only method of cure is radical and complete excision of the tumor, possible only when the disease is localized in the prostate. Approximately five per cent of cases now seen are curable; however, Kimbrough reports that 50 per cent of cases seen by him are operable. Jewett states that 11 per cent of his cases are operable. Certainly more patients will be saved as the disease is recognized in its early stages.

Radical excision can be performed by either the perineal or the retropubic route. We use the perineal route and do our biopsy, frozen section, and radical removal at the same time. Others prefer the retropubic approach, either because of training or because of a lack of frozen section facilities. The route of excision is relatively unimportant, but the time of excision is important. Mortality and morbidity are small in either procedure. Almost all patients are made impotent, but only about five per cent are left incontinent.

Palliative treatment is aimed at the relief of symptoms and at the slowing or stopping of tumor growth. The first objective is usually the relief of urinary obstruction, most easily accomplished by transurethral resection of obstructing tissue. The tumor can then be caused to regress by castration or by administration of estrogens.

Regression will occur in about 80 per cent of cases treated and will last a variable length of time. Several studies have been performed which indicate that combined therapy with castration and the administration of estrogens gives best results. We prefer this approach and give 1 mg. of stilbestrol daily after castration. If the patient will not permit castration, we give 5 mg. of stilbestrol daily. Others prefer to give Tace as the estrogen since adrenal hypertrophy does not occur with its use as it does with stilbestrol.

After the tumor begins to grow again, treatment is difficult, and no satisfactory answer has been

found. Some are injecting radioactive material into the local growth and are obtaining fair results. Others are giving radioactive phosphorus in an attempt to destroy bony metastases. Adrenalectomy by surgical excision or by medically induced atrophy is also being tried. Most patients obtain considerable relief from their symptoms with the administration of corticosteroids. This relief is temporary, and a regression of the tumor is seldom seen.

Radical excision of the early carcinoma gives the best prognosis by far. Jewett reports a ten-year survival of 50 per cent when the tumor is microscopically confined to the prostate. This compares exceptionally well with the ten-year survival of 53 per cent for normal men in that age group. Thirty-seven per cent of the patients in whom the tumor was confined to the prostate as evidenced by rectal palpation, lived ten years.

The prognosis in patients in whom the tumor cannot be removed depends upon the degree of malignancy and the presence or absence of metastases. The combination of castration and estrogen gives the best possible results, as reported by Nesbit and Baum in their series and more recently by Ganem in his series. The former report a five-year survival of 44 per cent when no metastases are present and 21 per cent when metastases are present. Castration alone gives a survival of 31 per cent when no metastases are present and 20 per cent when they are present. Estrogens alone give a poorer result.

Until a chemical cure is discovered, our greatest hope for better control of this disease depends upon earlier diagnosis and treatment. Earlier diagnosis depends upon routine rectal examinations and biopsy of all prostatic nodules. Removal of the entire prostate when the tumor is still confined will give a ten-year survival rate which is practically normal.

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It is the great destiny of human science, not to ease man's labors or prolong his life, noble as those ends may be, nor to serve the ends of power, but to enable man to walk upright without fear in a world which he at length will understand and which is his home.

—Paul B. Sears

Acute Intermittent Porphyria

Report of a Case Treated with Chlorpromazine

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Acute intermittent porphyria is a disease of unknown physiologic pathology. The characteristic metabolic defect is the production of certain abnormal porphyrin products and their excretion in the urine. Associated with this may be one or more of a classic triad of signs and symptoms; severe abdominal pains and constipation, peripheral neuropathy, and various emotional disturbances. A number of recent reviews summarize the clinical aspects of the disease.¹⁻⁴ Despite intensive study, the nature of the basic metabolic defect is not clear, its relation to the symptoms observed is unknown, and the mechanism by which symptoms are produced has not been demonstrated. Therefore, no truly specific treatment is available, and until recently there has been no satisfactory way of handling these patients, who are often desperately ill and may die of the disease.

One such patient has been under observation for the last two years, and has been found to respond symptomatically in a specific fashion to chlorpromazine, though there has been no observable change in the metabolic disturbance. Severe abdominal pain and gastrointestinal disturbances have been consistently relieved and psychic disturbances improved whenever this drug has been used. At the time this patient was being studied, similar results were being noted by others, and have since been reported.

Case Report

The patient is a forty-eight-year-old, married, white female first seen on January 27, 1955, complaining of severe abdominal pain, nausea, generalized aching and urinary frequency. She gave a history of rheumatism during childhood, and of repeated episodes of pain in the back and abdomen with nausea. At eight years of age, she had an appendectomy with relief of these symptoms. She had no difficulty with her four pregnancies, but shortly after the last child was born in 1935, she began to have episodes of upper abdominal pain. After a cholecystectomy in 1940 complicated by an abscess, she still had pain, and in 1942 a hysterectomy was done followed by some improvement. In 1951, she was found to have diabetes mellitus. This was managed by diet alone, and she got along reasonably well, though in 1953 she had a period of weakness and depression. She had been habitually constipated, and used cathartics frequently. She had had other episodes

of depression in the past, and gave a history of fairly frequent urinary infections. Her father had diabetes, but little information is available about the rest of her family. The urine of one child has been tested for porphobilinogen with negative results.

When the patient was first seen, she had been depressed and irritable for three months, she had been "worse" for four or five weeks and "down in bed" for five or six days. Abdominal pain had persisted despite "shots" by her family physician. On examination, she did not appear to be having as much pain as she complained of. She was apathetic and depressed, and quite uncommunicative. The abdominal wall showed multiple old scars, but no hernia. Although the patient complained of severe abdominal pain, there was no spasm and the wall

The use of chlorpromazine in acute intermittent porphyria rests primarily on an empirical basis, and probably this is not specific treatment as far as the basic disorder is concerned. Nonetheless, it provides dramatic, consistent, and effective relief of symptoms and frequently leads to remission. This alone makes it the most satisfactory agent available at present.

was flaccid. No masses were palpable. On pelvic examination, there was tenderness about the bladder. Neurological examination was normal. She was afebrile. The blood pressure was 120/65. There was some evidence of dehydration. The physical examination was otherwise not remarkable.

Laboratory findings showed pyuria and acetoneuria, and an electrocardiogram compatible with electrolyte disturbance. The patient was treated with penicillin and streptomycin for the infection, dimenhydrinate, parenterally, and chlorpromazine, 25 mgm. four times a day by mouth, for the abdominal symptoms, and gradually improved with return of laboratory tests to normal. She remained quite depressed, and was seen by a psychiatric consultant who recommended a trial of Dexamy®. She was discharged on this medication only.

Within three days, she began to have nausea and

abdominal pain, and was readmitted to the hospital with essentially the same picture, complaining of pain for which no organic basis could be found. The diabetes was controlled by diet alone as her symptoms subsided, and transient acetonuria was felt to be due to starvation. During her stay, the patient was treated with antibiotics, meperidine, dimenhydrinate, and chlorpromazine, and once more gradually improved. Cystoscopy showed a membranous trigonitis. She was again discharged on Dexamyl® and an antibiotic.

Four days later, she began to have pain again, and was finally readmitted in a similar state of semi-starvation and dehydration with a mild urinary infection. Once again she was treated with meperidine, chlorpromazine, and erythromycin. This time on discharge she was instructed to take chlorpromazine, 25 mgm. four times a day, as well as Dexamyl®.

On this regimen she appeared to do better and showed steady improvement for two months until she stopped the medications of her own accord. Within five or six days, she began to notice tiredness, recurrence of abdominal pain, loss of appetite and nausea. On June 2, she was readmitted with the same picture but without significant urinary difficulties. Chlorpromazine was started promptly and her symptoms cleared within three days. Three times in the next five months, she discontinued medications and experienced recurrence of symptoms.

It was in this period that she first reported that some of her urine specimens were "inky black" in color. Her urine was noted to darken in sunlight. The urine gave a negative test for homogentisic acid and coproporphyrin, but a positive reaction for urobilinogen in a dilution of 1:40, and a positive test for uroporphyrin after acidification. It was at this time that the diagnosis of the underlying disease was established.

Aside from intermittent glycosuria and acetonuria during her acute symptomatic episodes, laboratory studies have been unremarkable. Blood counts have always been normal. The highest sedimentation rate was 26 mm./hour. Most blood chemistries have been normal. Fasting blood sugars without insulin have ranged from 125 to 185 mgm. per cent. The glucose tolerance curve is moderately elevated. X-rays of the spine, upper gastrointestinal series, intravenous and retrograde pyelograms have been normal.

Once the diagnosis of porphyria was established Dexamyl® was discontinued because of its barbiturate content (though this did not appear to have any direct effect in producing symptoms). Chlorpromazine was continued because it had demonstrated a beneficial effect on her symptoms. This effect has since been shown to be highly specific. On repeated occasions the patient has discontinued

chlorpromazine because she was "feeling well." For the next forty-eight hours, she seems to be more active and alert and then becomes depressed, "tired," and very irritable. She notes the passage of dark urine, experiences cold chills and sweats about the fifth day, and then begins to have severe abdominal pains and nausea, and refuses food. On one occasion sweating predominated on the right half of the body.

In February, 1957, she was admitted to the hospital for regulation of her diabetes, and at that time chlorpromazine was deliberately withheld and the patient observed. This same sequence of events took place, and when she began to have abdominal pains chlorpromazine was again started in a dose of 25 mgm. four times a day, orally, with relief of symptoms in less than six hours. During this time, considerable quantities of porphobilinogen were continuously excreted in the urine, and specimens taken both during the period of withdrawal and after treatment was resumed were positive for this substance in dilutions of 1:320 to 1:640. So long as she takes 25 mgm. of chlorpromazine two to four times a day she gets along well.

Coulonjou, et al.⁵ reported a case of acute intermittent porphyria, treated with chlorpromazine in 1953, and one treated in 1954 in India has been reported by Singh and Chandy.⁶ This latter patient was given chlorpromazine as a hypotensive agent and the author attributed the improvement in her overall picture to the concomitant use of ACTH. However, ACTH has been very inconsistent in producing remissions in this disease and generally only slowly. Muller⁷ reported a remission after a "lytic cocktail," which included chlorpromazine. In this country, Durst and Krembs⁸ mentioned relief in one case treated in 1955. Melby, Street and Watson⁹ have published reports of nine cases, either treated by them or reported to them, which have shown this same specific benefit from chlorpromazine, and Monaco, Leeper, Robbins and Calvy¹⁰ have reported four similar cases. Martin and Heck⁴ mention the use of chlorpromazine without giving any specific details or citing cases.

The benefit from the use of this drug in all of these cases has been consistent, regular and reproducible. When given in adequate dosage, prompt relief of pain, vomiting and major emotional disturbances is to be expected. Apparently, a slower remission of acute neurological disturbances has been noted,¹¹ though established paralysis is not altered. Some patients after being treated during the acute phase will enter a remission and require no treatment until the next attack. Others, like the patient reported here and Melby's⁹ Case 7, require continuous treatment to prevent recurrence of symptoms. No case has

been reported that did not show at least marked improvement.

No consistent effect on the excretion of porphyrins has been noted, though in cases where remission follows the levels may fall. Monaco, et al.,¹⁰ have made the interesting observation that when chlorpromazine is given to patients with latent porphyria, manifested only by the urinary products, an excessive and disproportionate somnolence is induced. In the case reported here the amounts of porphobilinogen have shown little variation though as symptoms improve pigmented materials disappear. The drug has been given both intramuscularly and orally, and doses have varied from 50 mg. a day to several hundred in reported cases. Generally, 100 mg. given parenterally will control acute symptoms, and patients thereafter can be treated with oral medication usually in the dose of 100 mg. a day or less.

One can only speculate on the mechanism of action of chlorpromazine in these cases. One attractive hypothesis is that this drug's recognized tranquilizing effect corrects emotional disturbances which might precipitate the acute attacks. It is well known that these patients have many personality peculiarities, and are notoriously unstable. A number of authors have commented on this, and both Gunther¹² and Roth¹³ have postulated in the past that emotional difficulties may well precipitate the symptoms in a person who would otherwise have only the latent metabolic defect (presumably inherited). This hypothesis would certainly be consistent with the events in the case here reported since the drug was used initially for the purpose of treating emotional difficulty, and apparently demonstrated its effectiveness in this respect, even before the diagnosis of porphyria was established.

A second hypothesis is that the drug in some way interferes with autonomic pathways which are involved in the production of the symptoms. Ganglionic blocking agents have been demonstrated to be of benefit in the abdominal crises, and chlorpromazine is thought to have an effect both on the diencephalic autonomic centers, and also on the acetylcholine transmission system. This would appear to explain benefit noted in abdominal cases, but does not clarify the effect on the neurologic disturbances.

A third possibility is that chlorpromazine alters the actual porphyrin metabolism. This is known to involve certain oxidative enzyme systems, and chlorpromazine may depress these in some way. However, none of the metabolic data reported to date have demonstrated any alteration in the porphyrin metabolism that might go with this.

So far as the effect of other similar drugs is concerned, little is known as yet. Melby, et al.⁹

noted two patients who were treated with reserpine and apparently had some improvement, but certainly not the dramatic and fairly complete relief of symptoms noted with chlorpromazine. This may be due to the slow action of this drug. They also reported one patient who had been treated with meprobamate, with no relief and possibly an exacerbation of symptoms. The effects of barbiturates in this disease are well known, and they are considered to be definitely contraindicated. Likewise, in some reported cases, the newer soporifics and sedatives have appeared possibly to precipitate attacks. It is worth noting that this patient was given dimenhydrinate intramuscularly at the beginning of each of her admissions and this seemed to be of some benefit.

Patients with the disease are sufficiently uncommon, and new drugs are so numerous that it may well be some time before the whole field can be adequately explored, particularly since great caution must be used to avoid precipitating attacks. In fact, Donnadieu, et al.¹⁴ have reported the appearance of porphyrinuria in two psychotic patients treated with chlorpromazine. There are, however, insufficient data given to evaluate this observation and it has not been reported elsewhere to my knowledge.

The occurrence of diabetes mellitus in this case would seem to be coincidental except perhaps for a parallel hereditary factor. Sterling, et al.¹⁵ reported three cases, in all of whom diabetes preceded the appearance of symptoms of porphyria, and Brunsting¹⁶ mentions several cases of diabetes (or diabetic parents) in a series of "mixed" or cutanea tarda type (which may be a different disease). Generally, the incidence of diabetes as an "associated disease" does not appear to be excessive, nor does porphyria seem to be unusually frequent in cases of diabetes mellitus.

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PRESIDENT'S PAGE

DEAR DOCTOR:

Shortage of nurses is universal, a vexing problem of growing seriousness, threatening to become increasingly acute.

There are various reasons. Actually there is an increased proportion of active graduate nurses, 32 per 100 patients, as against 15 in 1930. But the work week is reduced by 23 per cent. There is less utilization of student nurses in training, and there are now only two-thirds as many nursing schools as in 1930. There is increased demand on a nurse's time for records and clerical work and for administrative duties. There is increased hospital utilization by more patients with a more rapid turn-over. More nurses are entering fields other than hospital nursing. Finally, an enormous factor, the number employed by federal agencies has increased seven-fold since 1930, from 4,703 to 31,164.

The trend is toward higher and higher standards of nursing education, increased stress toward training for administrative and supervisory capacity, and away from bedside nursing. Less and less is the graduate nurse prepared for, or interested in, direct patient care, "bedside nursing." Those services are very inadequately supplied by nurse aids and, to a very limited extent, by one-year-trained "practical nurses." The net result is inadequate nursing care of depreciated quality.

The military services have contributed largely to this situation. The registered nurse is granted a commission on the same basis as a West Point graduate and placed in line for promotion. These nurse-officers perform little or no "bedside nursing" and are essentially restricted to desk positions.

The graduate nurse, the R.N., does fill a particular need. She may very well continue with the higher educational requirements, including even the college degree if deemed necessary. The practical nurse is useful, but her capacity is definitely limited, and a great void exists between her potentialities and those of the R.N.

There is a simple answer to satisfy the crying need in this area. The need is for "bedside nurses." A two-year course of training in nursing schools re-established in hospitals throughout Kansas will effectively supply such nurses in ample quantity. The instruction must, of course, be both didactic and clinical, but any number of our hospitals can, as they have in the past, furnish very adequate instruction of this nature. There are large numbers of intelligent, alert, eager Kansas girls who earnestly desire to become nurses, but who cannot afford the tuition and other costs of present courses of nurse training.

Such "bedside nurses" would not qualify for the R.N. degree. They would not be considered as trained for administrative positions nor as supervisors. They would not be in line for military commissions, though they could probably be considered for non-commissioned officers.

They would, however, furnish a pool of competent, capable "bedside nurses" whose ambition and aim would be nursing care of the patient.

The medical profession can render a great service by cooperating with the nursing associations and the hospital organizations in a concerted effort to institute nursing schools of this type, and to obtain legislation to legalize the licensing of "bedside nurses" with such training.

Fraternally yours,

A handwritten signature in dark ink, reading "Darrin A. Nelson". The signature is fluid and cursive, with the first name "Darrin" being particularly large and stylized.

President

EDITORIAL COMMENT

A Modern Medical School

The following statement of the functions and structure of a modern medical school, approved by the House of Delegates of the American Medical Association on June 5, 1957, was prepared in collaboration with the Association of American Medical Colleges and represents the general concepts of that organization as well as the Council on Medical Education and Hospitals of the American Medical Association. Experience indicates that high standards are best nurtured in an environment in which there is not excessive concern with standardization. The concepts expressed here will serve as general but not specific criteria in the medical school accreditation program. However, it is urged that this document not be interpreted as an obstacle to soundly conceived experimentation in medical education.

Responsibilities and Objectives

As an institution of higher education, a medical school has three inherent responsibilities which are so closely related as to be inseparable.

1. A medical school should provide for its undergraduate students the opportunity to acquire a sound, basic education in medicine and should foster the development of lifelong habits of scholarship.

2. A medical school should contribute to the advancement of knowledge through research.

3. A medical school should contribute to the development of teachers, investigators and practitioners through programs of graduate education including residency training.

By virtue of its university orientation or as a result of the clinical facilities and personnel available, a medical school should assume additional responsibilities such as those listed below to the degree that its resources permit without weakening its basic program:

1. Leadership in the development of adequate opportunities for the continuing education of practicing physicians.

2. Professional service to patients primarily to fulfill its educational and research obligations.

3. Participation in the educational programs of other professions in the health field, such as dentistry, nursing, and pharmacy, as well as in selected areas of the general university program.

4. Training of technical personnel in paramedical fields.

A medical school should develop a clear definition of its total objectives, appropriate to the needs of the community it is designed to serve and the resources at its disposal. When objectives are clearly defined, they should be made familiar to faculty and students alike,

so that efforts of all will be directed toward their achievement.

A statement of "The Objectives of Undergraduate Medical Education" has been prepared by the Association of American Medical Colleges. It is believed that this can well serve as the basis for a definition of this portion of the over-all objectives of a medical school and is reproduced in part below. The full statement can be found in the *Journal of Medical Education* (28:57-59 (March) 1953).

"Undergraduate medical education must provide a solid foundation for the future physician's development. It should not aim at presenting the complete, detailed, systematic body of knowledge concerning each and every medical and related discipline. Rather, it must provide the setting in which the student can learn fundamental principles applicable to the whole body of medical knowledge, establish habits of reasoned and critical judgment of evidence and experience, and develop an ability to use these principles and judgments wisely in solving problems of health and disease.

"Undergraduate medical education cannot achieve these aims if the student is relegated to a passive role. It must provide incentive for active learning on the part of the student. This can best be done by giving him definite responsibility in real, day-to-day problems of health and disease. This responsibility must, of course, be carefully graded to the student's ability and experience and must be exercised under careful guidance by the faculty.

"Given incentive to learn and guidance toward the grasp of principles, with the problems of health and disease as a frame of reference, the student will build the necessary foundation for his career in medicine, be it practice (general or limited), teaching, research or administration.

"In working toward this fundamental objective, undergraduate medical schools must strive to help the student to: acquire basic professional knowledge; establish essential habits; attain clinical and social skills necessary to the best utilization of that knowledge; and develop those basic intellectual attitudes, and ethical or moral principles which are essential if he is to gain and maintain the confidence and trust of those whom he treats, the respect of those with whom he works and the support of the community in which he lives.

"These . . . aims are obviously not distinctly separable, but are mutually interdependent. All together they summarize the desirable characteristics of the responsible professional person medical education is attempting to produce."

Organization and Administration

A. *Governing Body.* A medical school should be incorporated as a nonprofit institution, if possible as

a part of a university, since a university can so well provide the milieu and support required by a modern medical school.

If not a component of a university, a medical school should have a board of trustees composed like that of a university of public spirited men or women having no financial interest in the operation of the school or its associated hospitals. The trustees should serve for fairly long and overlapping terms.

Officers and faculty of the school should be appointed by the board of trustees. In keeping with generally accepted principles of administration, it is usually not desirable for a member of the board of trustees to serve simultaneously as an administrator or a member of the faculty of the medical school.

The manner in which the medical school is expected to conduct its affairs, including the responsibilities and privileges of administrative officers, faculty, and students, should be clearly indicated in by-laws approved for the medical school itself or adequately presented in the by-laws of the parent university.

B. Administrative Officers of the Medical School. There should be competent supervision of the medical school by the dean or other executive officer who, by training and experience, is qualified to provide leadership in interpreting high standards in medical education, and who has sufficient authority to implement such standards. The dean should have the respect and support of the faculty and ready access to the university president and other officials. The establishment and maintenance of a congenial and productive relationship with the local medical profession is desirable and important to the school and the profession. It can be best assured through discussions of mutual problems by representatives of the school and practicing profession.

Because of the diverse and heavy responsibilities placed upon the dean or executive officer, assistance by suitably qualified persons should be provided. In many medical schools, for example, there is an assistant dean who devotes major attention to student affairs and another assistant for administering the postgraduate program. In the conduct of the fiscal affairs of the school, the dean should have the assistance of a capable business officer.

C. Faculty Organization. The faculty should be organized into suitable departments representing the major basic science and clinical fields. It is to be noted that this is primarily an administrative convenience; it should not form the sole basis for structuring the curriculum. Each such department should have a voice, through appropriate committees of the faculty, in the administration of the academic affairs of the school. Foremost among these should be an executive committee of the faculty composed primarily of the responsible administrative officials and

the chairmen of those departments which have a major role in the educational program. Usually these are Anatomy, Physiology, Biochemistry, Microbiology, Pharmacology, Pathology, Medicine, Surgery, Pediatrics, Obstetrics-Gynecology, Psychiatry, and Preventive Medicine, and Public Health. This commonly utilized pattern allows for balance between basic science and clinical viewpoints in the committee's major function of determining, with the dean, medical school policies for consideration, where indicated by higher university authority.

There should be such committees of the faculty as admissions, promotions, curriculum, postgraduate medical education, library, and others needed to serve the welfare of the school.

The entire faculty should meet one or more times annually to provide an opportunity for all faculty members to become acquainted with and to discuss medical school policies and practices.

Nominations for faculty appointments should originate in the faculty under the leadership of the dean. Commonly, nominations for appointments at the lower academic ranks are made by the head of the department concerned, after thorough discussion of the nominees by the entire department. At the professorial and the associate professorial levels this procedure may be profitably supplemented or supplanted by the appointment of a nominating committee composed of members of several departments, whose standing and judgment are generally unquestioned. Recommendations are made to the faculty executive committee and dean who, in turn, recommend to the president and board of trustees through established administrative channels.

D. Finances. Experience has established that a medical school cannot successfully carry out its many activities solely on the income derived from student fees. Furthermore, certain of these activities are not directed primarily to the education of the medical student and he should not be expected to support them. To adequately fulfill its obligation, a medical school should have other substantial sources of revenue.

Each department within the school should prepare its budget in consultation with the dean, who is ultimately responsible for the total budget and its presentation to the proper authority.

Faculty

The school should have a competent staff with demonstrated interest and ability in teaching and research. Such dual activity by the faculty is most likely to provide the educational milieu appropriate in a modern medical school as well as best carry out its objectives and responsibilities.

Reasonable security of tenure and possibility of ad-

vancement should be assured in order that the personnel of the faculty may have adequate stability. Compensation of full time members of the faculty should be sufficient to enable them to support themselves and their families.

The number of instructors in each basic science and clinical department should be sufficient to meet the requirements of a modern medical educational program as well as allow adequate time for research by each instructor. Full time teacher-student ratios may vary widely depending on the course content, educational methods, research activities, the availability of competent part time or voluntary staff, and other factors. Recognition of the values of intimate teacher-student relationships and widespread use of methods favoring the active role of the student in his own education have decreased dependence on didactic exercises. Increasing use has also been made of interdepartmental teaching. These factors have tended to increase the relative size of the instructional staff.

The faculty personnel in the basic science disciplines should be almost entirely on a full time basis. In the major clinical areas of medicine, surgery, pediatrics, psychiatry, obstetrics and gynecology, there should be a nucleus of full time instructors who have as their major responsibility the planning and supervision of the department's educational program and the conduct of research.

Students

The admission of students to a medical school should be the responsibility of a committee of the faculty. Decisions regarding admission should be based not only on satisfactory prior scholastic accomplishment but also on such factors as personality and emotional characteristics, motivation, industry, resourcefulness, and health. Evaluation of these factors should be developed through personal interviews, college records of academic and nonacademic activities, results of medical college admission tests, and pertinent letters of recommendation. All records dealing with admissions should be carefully filed and procedures periodically reviewed in a search for better methods.

At least three years of college education is required for most students and four years is recommended as a preparation for medical study. Only rarely and under exceptional circumstances will a medical school be justified in admitting a superior student after two years of college study. The National Committee of Regional Accrediting Agencies maintains a listing of institutions of higher education which have been found to offer commendable educational programs. Prospective medical students should acquire their preparatory education at a college of arts and sciences so listed and a medical school admissions committee should scrutinize with particular care the

qualifications of applicants whose preparatory study has been done at other institutions.

Because basic knowledge of biology, physics, inorganic and organic chemistry and human behavior are the foundation stones of medicine, adequate college courses in these subjects, as well as demonstrated competence in English, should be required. It is important that a medical college restrict its admission requirements to this minimum so that a college student preparing for the study of medicine will have the opportunity to acquire a broad liberal education or to study a specific field in depth according to individual interest and ability. The complexity of modern medicine can be best served by physicians who in composite represent variety of backgrounds in education and experience.

Advanced standing may be granted to students for work done in other medical schools, but only when a student's previous work is qualitatively and quantitatively equivalent to that required of regularly enrolled students, as officially verified by correspondence with the school previously attended. Because of the diversity and greater integration of the total curriculum, transfers are becoming increasingly difficult but usually are least disruptive of the student's education at the end of the second year.

The number of students who can have an adequate education in a medical school is related to the laboratory and hospital facilities available and to the size and qualifications of the teaching staff (see also: Faculty). A close personal contact between students and members of the teaching staff results in a quality of educational experience that is not possible in an institution where the number of students is excessive in relation to the staff and facilities.

There should be a system of student records showing conveniently and in detail the admissions credentials as well as the grades or other records of performance in the school, by means of which an exact knowledge can be obtained regarding each student's work and qualifications. Qualitative evaluations of each student by instructors should be included in the student records.

An adequate provision for student counseling should be in effect. Many schools have an assistant responsible to the dean for such counseling.

There should be an active student health service providing for periodic medical examination and medical care for the student body. This is important not only in the maintenance of student health but also because of its inherent educational values.

Facilities

A medical school should own or enjoy the assured use of buildings and equipment adequate quantitatively and qualitatively to provide an environment most

conductive to productivity of faculty and students in the fulfillment of the total objectives of the school. If possible, all of the basic medical sciences should be housed in a building which adjoins in some manner the clinical facilities so as to promote cooperative teaching efforts and allow all departments ready access to clinical material.

A well maintained and catalogued medical library that can be used conveniently and effectively by both students and faculty is essential to a modern medical school. A trained librarian with experience in medical library work should be employed to supervise the development and operation of the library with the advice and assistance of an active representative committee of the faculty. The library should receive regularly the leading medical periodicals, the current numbers of which should be readily accessible. Adequate arrangements should be made by the librarian and the faculty to instruct all students in the use of the library at the beginning of their medical studies.

The school should own or have the unquestioned right to appoint the attending staff of a general hospital for clinical teaching. In the event that a medical school depends for clinical teaching on an independent hospital, it is essential that the clinical teachers, either on nomination by the school or by agreement in conference between school and hospital, be appointed by the hospital trustees to appropriate positions on the hospital staff.

The teaching hospitals should be either adjoining or in close proximity to the school and should provide sufficient patients to permit students individually to observe, work up, and study the progress of the common variety of medical and surgical cases as well as a fair number of patients in each of the other major specialties.

There should be a sufficient number of patients so that each student on a hospital clerkship can be assigned that number of new cases of teaching value each week for thorough study that the faculty judges to be of maximum educational value. For example, this may be two new patients a week in one department or five new cases weekly in another, depending upon the orientation objectives and teaching program of the department concerned. Therefore, no fixed number of hospital beds or patients per student can be established because of the variables involved. Medical education should emphasize intensive long term study by each student of relatively fewer patients rather than superficial observation of many patients.

The school should own or have unquestioned use of well ordered facilities for the diagnosis, treatment and follow-up of ambulatory patients. The attending staff should be drawn from the faculty including those of senior rank. The number of new cases per day available to each student serving an outpatient clerk-

ship should be compatible with the educational objectives and teaching program of the department as well as the school.

There should be sufficient offices, laboratories, and conference rooms as a part of or conveniently close to the hospital and outpatient clinical facilities to meet the needs of faculty and students. The hospital floors should provide adequate space and facilities for student clerks to study their patients.

Educational Program

Before the curriculum, methods and details of an educational program can be decided, the objectives of the program should be formulated.

The objectives should clearly indicate that an undergraduate medical education provides merely a sound foundation for further education during the internship and residency periods, as well as throughout professional life. Four years of education in medical school is not by itself sufficient to prepare a physician for practice today. In fact, the yearly advances in medicine demand that each physician continue his education throughout his career. It is also obvious that no physician can master the whole spectrum of medical knowledge.

No rigid curriculum can be prescribed for accomplishing the objectives of medical education. On the contrary, it is the responsibility of the faculty of each school continually to reevaluate its curriculum and to provide in accordance with its own particular setting and in recognition of advances in science a sound and well-integrated educational program. Each school should utilize those methods and approaches that the particular interests and abilities of the faculty indicate would provide the most effective education in the framework of the available facilities. The traditionally separate disciplines are finding rewarding educational and research results in working together cooperatively.

Through the various educational methods and to the extent deemed best by the faculty to accomplish the objectives of medical education, each medical school should offer education in the following subjects during the four year curriculum:

Human Anatomy, Biochemistry, Physiology, Microbiology, Pharmacology, Pathology, Clinical Laboratory Diagnosis, Physical Diagnosis, Internal Medicine, Pediatrics, Obstetrics and Gynecology, Preventive Medicine and Public Health, Psychiatry, Radiology, and Surgery. Specialty areas in medicine and surgery are best integrated in the teaching of the major disciplines. Consideration of social, emotional and environmental factors in health and disease is properly the responsibility of all clinical departments. Medical ethics, legal medicine, biostatistics and medical genetics should be included in the educational program.

The traditional emphasis on lectures, demonstrations and amphitheater clinics in which the role of the student is passive has shifted to greater use of individual student and small group projects, conferences, seminars, and the "case method" of education, in all of which the student actively participates in his own education.

The allotment of some unscheduled student time in the weekly program to allow for reading, research or other independent pursuits is desirable.

In the clinical years particularly, there is no substitute for the "case method" of clinical education, in which individual students work up individual patients under guidance in the hospital wards and in outpatient clinics. Such assignments should occupy most of the time and energy of third and fourth year medical students. The student should be encouraged to feel a genuine responsibility as part of a team of physicians studying the patient, and not as a classroom student with prescribed hours of work. The student's work-up of each case including progress notes should become part of the hospital's permanent record of the case. Such case studies should serve as the point of departure for informal conferences, rounds, and reading. Lectures and other didactic exercises cannot replace though they may supplement bedside learning.

Accreditation of Medical Schools

The American Medical Association through its Council on Medical Education and Hospitals and the Association of American Medical Colleges through its Executive Council serve as the recognized accrediting agencies for medical schools. Through retaining their individual identities, both groups work very closely in this activity through the Liaison Committee on Medical Education. To be accredited, a medical school must be considered approved by the Council on Medical Education and Hospitals and offered membership in the Association of American Medical Colleges. This is granted on the finding of a sound educational program as a result of a survey conducted jointly by both organizations.

It is the intent that newly developing medical schools should be surveyed during each of the first four years of active existence. Provisional accreditation is granted, when the program warrants, for the first two years of the curriculum and definitive action is taken during the implementation of the fourth year of the curriculum.

Existing medical schools are surveyed at regular intervals. Every attempt is made to fulfill requests for interim surveys as a consultant service to the medical schools.

A medical school to be surveyed is requested to provide basic information on forms forwarded in advance. After careful study of this material, the sur-

vey team of three or four members visits the medical school for three to five days. On completion of its visit, the survey team confers with the responsible administrative officials of the medical school and its parent university, indicating to them the nature of the major findings and recommendations. A complete, written report is prepared and considered separately by the Council on Medical Education and Hospitals and the Executive Council of the Association of American Medical Colleges and then jointly by the Liaison Committee on Medical Education. The action of each group and the complete report is then transmitted to the medical school dean and university president.

Additional data can be obtained from the Secretary, Council on Medical Education and Hospitals, American Medical Association, 535 North Dearborn St., Chicago 10, or the Secretary, Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Illinois.

Pediatrics Society Meets

The annual meeting of the Kansas Pediatrics Society was held at the Broadview Hotel, Emporia, on September 7. Dr. Theodore E. Young, Winfield, was elected president for 1958, Dr. Hilbert P. Jubelt, Manhattan, was named vice-president, and Dr. Thomas C. Hurst, Wichita, was chosen secretary-treasurer.

Two speakers, Dr. Charles Upton Lowe, Buffalo, New York, and Dr. Michael Furcolow, Kansas City, presented a program with discussions following the lecture periods.

Surgeons Elect Officers

Dr. Orville R. Clark, Topeka, took office as president of the Kansas Chapter of the American College of Surgeons at a meeting held at Great Bend on September 15. Dr. Marion F. Russell, Great Bend, was elected vice-president and president-elect, and Dr. Robert W. Myers, Newton, was named secretary-treasurer. Plans were made for a 1958 meeting to be held in Wichita.

Pharmaceutical Firms Merge

Stockholders of Schering Corporation and White Laboratories, Inc., voted in separate meetings last month to merge the two firms into a single pharmaceutical company. The merger became effective on September 19 with Schering as the surviving corporation.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

In the last few years interest has built up in the problems of older people—how they are to get their bills paid, how to spend their time constructively, what chronic medical conditions are causing them the most trouble. Innumerable national and local conferences have searched for ways to make life more satisfying and healthy for people entering old age, and committees are at work on the problem in thousands of communities.

In this favorable climate, when every device that might help the older citizens is being examined, there is being revived a scheme that met with no success at all when first proposed more than six years ago.

It is a plan for government-paid hospitalization under the Old Age and Survivors' Insurance system.

Here is the argument that is made for it:

People in old age generally have less income than when they were younger, but at the same time they require more medical attention and hospital care. Neither voluntary nor commercial health insurance has been able to offer these people the protection they need. The only solution, sponsors of the plan say, is to get the federal government into the picture.

Opponents of the idea agree that older people are sick more often and generally don't have much money, but they disagree violently with the other arguments. They point out that slowly but surely insurance coverage is being extended to older people at a price they can afford to pay. Most important, hospitalization-at-65 critics maintain that a system like this is in effect national compulsory health insurance under Social Security.

Early this year Reps. Emanuel Celler (D., N. Y.) and John Dingell (D., Mich.) introduced bills on this subject. They would allow 60 days a year free hospitalization for OASI-covered men 65 and over and women 62 and over. Rep. Kenneth A. Roberts (D., Ala.) offered a similar bill.

Just before the session ended two developments occurred that are evidence the proponents of this system of hospitalization are getting ready to make a real fight for it next year.

First, Rep. Aime J. Forand (D., R. I.) presented a bill that would make extensive liberalizations in the social security program, including creation of a hospitalization that would give free surgical service to

the aged program. Some national labor leaders immediately pledged their support to this bill, a not unexpected move as the AFL-CIO is officially behind the general idea.

Then Senator Richard L. Neuberger (D., Oregon) made it plain he, too, wanted the old people to have free in-hospital medical care. The senator said he hadn't firmed up his thoughts, but that he believed the best approach would be something like the Military Dependent Medical Care program (Medicare), making use of Blue Cross or other nonprofit groups. He estimates that a 1 per cent increase in payroll taxes for both employer and employee would meet the extra costs.

Mr. Forand, on the other hand, is specific. He would make all persons receiving OASI retirement benefits eligible and also surviving widows and children, but would not include persons receiving OASI disability payments. He would broaden the time period by allowing 120 days of hospital or nursing home care each year, with hospital stays limited to 60 days.

The Forand measure also has a provision, not contained in most earlier bills, for OASI also to pay for in-hospital surgical services certified as necessary by the physician.

Mr. Forand would take no chance of running out of money. He would levy social security payroll taxes on all income up to \$6,000 (present limit \$4,200), and also increase the tax rate a half per cent for employer and employee alike, and three-quarters of one per cent for the self-employed.

It is almost certain that these and other similar suggestions will receive serious consideration by Congress next year, with passage of a bill much more likely than in 1951 when President Truman and Oscar Ewing first proposed the idea.

Notes

When Congress returns January 7, one of the measures waiting its attention will be a bill to control union welfare funds through registration and publicity. (Most funds involve medical-hospital benefits.)

Jenkins-Keogh legislation, for deferment of income taxes on money put into retirement plans by the self-employed, now is assured of a hearing next year when the House Ways and Means Committee goes into all phases of taxation.

American Medical Association is cooperating with American Hospital Association in an effort to persuade the Federal Communications Commission to set aside radio channels for exclusive use of doctors and hospitals.

Tumor Conference

Multiple Eosinophilic Granulomas of Bone

Edited by Howard P. Fink, M.D.

Dr. Stowell (Moderator): This case illustrates an uncommon type of bone lesion which is not generally regarded as neoplastic but which is confusable, clinically and radiographically, with a number of neoplastic diseases.

L. W. Akers (Junior Medical Student): The patient is a 22-month-old white boy who was first admitted to this hospital three weeks ago because of irritability and lumps on the head. He had been in good health until about 11 months prior to admission when he had a severe crusting dermatitis of the scalp. This was diagnosed as cradle cap and treated with various medications without much relief. The dermatitis was considerably improved when, about five months prior to admission, he had some sort of trauma to his forehead, followed by the appearance of a persistent lump at the site of injury. This lump did not progress in size. An x-ray was taken of the skull about a month later, and two radiolucent spots were noted in the skull beneath the lump. It was believed then that the patient had an abscess of the skull. He was treated with antibiotics, but no regression of the swelling resulted. During the following four months, the patient sustained several other minor episodes of head trauma, followed by indolent swellings. Blood counts done during this time at another hospital revealed iron-deficiency anemia. The boy had an intermittent low-grade fever for a week or two prior to his admission here.

The past history and family history are not remarkable. System review is essentially negative, except for the fact the child has become increasingly irritable during the past year.

On admission the boy appeared well-developed, well-nourished, and somewhat irritable. There were four or five soft, non-fluctuant, tender subcutaneous swellings on the head, ranging in size from 2 to 6 cm. in diameter, which showed no evidence of acute inflammation. A few of these lesions were somewhat depressed in the center. Venous dilatation was present in the skin overlying the swellings. A few small cervical nodes were palpable. The liver edge was felt about one finger below the costal margin. The

spleen was perhaps slightly enlarged. The rest of the physical examination was negative.

The urine was normal. The hemoglobin was 10.6 grams; the white blood count was 8100, with 42 filamented and 13 non-filamented neutrophils, 1 eosinophil, 40 lymphocytes, 3 monocytes, and 1 metamyelocyte. The platelet count was 92,000. Bleeding time was one minute and clotting time 4 minutes. Blood glucose was 79 mgm. per cent, serum albumin 3.82 gm. per cent, serum globulin 1.68 gm. per cent, cholesterol 129 mgm. per cent with 69 per cent esters. Sternal marrow biopsy showed hyperplasia of the marrow, particularly erythroid hyperplasia and eosinophilia. The marrow contained scattered macrophages, some of which had foamy cytoplasm. Two biopsies of the head lesions were also done, and extensive x-ray studies were made.

Dr. Boley: Did each swelling appear after a specific trauma?

Mr. Akers: The history is vague on that point; but the boy's mother enumerated several episodes of mild injury, each followed by a lump.

Dr. Tice: Does the patient have any exophthalmos?

Mr. Akers: No.



Figure 1. Roentgenogram showing multiple rounded radiolucent areas in cranial vault.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Fink is a Trainee of the National Cancer Institute.

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control, with minimal side effects, over a wide variety of infections - reasons why ACHROMYCIN is one of today's foremost antibiotics.

Dr. Stowell: Would you discuss the x-rays, Dr. Goertz?

Dr. Goertz: In the skull plates many irregular radiolucent foci are easily seen (Figure 1). Most of these are in the frontal and the anterior parietal areas, but a few are present in the occipital region as well. In the antero-posterior view, rarefaction is also seen in the floor of the right orbit and in the right petrous pyramid.

In the chest films, the heart and lungs appear normal, but numerous areas of radiolucency are present in the ribs. Similar areas can be seen in the pelvis and in both femurs. There is slight enlargement of the liver and spleen. No lesions of the upper extremities are discernible.

The radiographic diagnosis was reticuloendotheliosis. Metastatic neuroblastoma was considered as a secondary possibility.

Dr. Tice: I think many disease processes which can give rise to multiple osteolytic lesions of bone must be thought of in the differential diagnosis in this case. In view of the patient's age, certainly the two most likely possibilities are reticuloendotheliosis of the Letterer-Siwe or eosinophilic granuloma type, and the Hutchinson pattern of metastases from a neuroblastoma of the adrenal. The latter lesion is not ruled out by the absence of proptosis and lymphadenopathy. Polyostotic fibrous dysplasia of bone is rare in this age group, and the patient does not have the endocrine disturbances and cafe-au-lait skin spots characteristic of this disease. If the patient were an adult, multiple myeloma, osteitis fibrosa cystica, and metastatic carcinoma, especially from a carcinoma of the lung, kidney, thyroid, or breast, should be given prime consideration.

Dr. Stowell: Dr. Helwig, what does the biopsy of the skull lesion show?

Dr. Helwig: The tissue contains no bone; it consists of a helter-skelter mixture of histiocytes, eosinophils and lymphocytes, constituting the classical picture of eosinophilic granuloma of bone. Immense numbers of massed eosinophils can be seen in some areas.

A feature of special interest in this case is the multiplicity of the lesions. Eosinophilic granulomas of bone are multiple in 20 to 60 per cent of cases; the figure varies with the investigator. Probably a good many multiple lesions are overlooked because of lack of complete skeletal surveys on patients with supposedly single eosinophilic granulomas. In order of frequency, the ribs are involved most often, the scapulae second, the ilia third, the femurs fourth, and the skull fifth. The disease is most frequently seen in infants and children, but it occasionally occurs in adults, even those of middle age and older. Both

single and multiple lesions may be accompanied by mild fever and slight leukocytosis, sometimes with an excess of circulating eosinophils. I believe the present case showed eosinophilia in the sternal puncture specimen, though not in the peripheral blood.

Dr. Diehl: I might add that the lesions tend to be multiple in infants and single in older children and adults, though this is not an absolute rule.

Certainly the histologic picture that Dr. Helwig has outlined for us in this case is typical of eosinophilic granuloma. However, I wish to ask the pathologists what the possibility is that this disease process may later develop into Hand-Schüller-Christian's or Letterer-Siwe's disease, what the relations are among these three entities, and whether other organ systems besides the bones can be involved by eosinophilic granuloma. These questions are of great importance in determining this child's prognosis.

Dr. Mantz: They are also exceedingly difficult ones, and I am sure it would be hard to find two pathologists who agree absolutely on the answers. I believe that most investigators now accept these three diseases as different manifestations of one essential process, that of excessive proliferation of reticuloendothelial cells, or reticuloendotheliosis. Although the hyperplasia sometimes seems to have no natural limit, most pathologists are unwilling to consider the process a neoplastic one. Letterer-Siwe's disease, however, does have some features in common with the lymphomas. The proliferated cells in the Hand-Schüller-Christian syndrome for the most part retain their normal function, that of phagocytosis; while in the Letterer-Siwe syndrome they do not. Phagocytosed material, if present, consists of lipid; but the proliferation, not the phagocytosis, appears to be the essential feature, so that none of these conditions can properly be considered a lipid storage disease. Lichtenstein¹ has recently clarified and restated this concept; he refers to this group of syndromes as "histiocytosis X," and suggests that a given case may be diagnosed more specifically as "histiocytosis X with manifestations of" Letterer-Siwe's disease, Hand-Schüller-Christian's disease, or eosinophilic granuloma.

The present case illustrates well the close inter-relationship of these three syndromes. As Dr. Helwig has said, the biopsy specimen is a classic example of eosinophilic granuloma; but the history of anemia, fever, a cutaneous eruption, and slight hepatosplenomegaly suggests systemic involvement, which in turn inclines one to the diagnosis of subacute Letterer-Siwe's disease. According to prevailing opinion, the latter disease carries a fatal or at least a grave prognosis. However, this gloomy outlook may well

be altered in the near future. I recall a child who had the classical signs, symptoms, and pathological changes of Letterer-Siwe's disease. His parents were frankly told to expect him to become debilitated and die in a short period of time. Several years later, when an attempt at follow-up was made, the child was found to be in excellent health. Such a case as this indicates that we should either revise our diagnostic criteria for Letterer-Siwe's disease, or else give up the belief that it is a universally fatal condition.

Most monostotic, and even many polyostotic, eosinophilic granulomas will regress and eventually heal completely if treated with x-ray. Some progress, with or without remissions, to the multiple xanthomatous lesions of Hand-Schüller-Christian's disease. In still other cases, resembling the one under discussion today, the Letterer-Siwe syndrome eventually develops; the reticuloendothelial proliferation becomes widespread, with little or no lipid storage, and ultimately death results. Present understanding of these diseases is so incomplete that in a given case I think only the patient's subsequent course reveals the final answer.

In reply to Dr. Diehl's last question, I can say that many cases of eosinophilic granulomas in organs not usually considered part of the reticuloendothelial system have been reported, most of them in the lung, and most of them associated with widespread involvement of bones.

Dr. Tice: Dr. Mantz, what is the present concept of the relation between histiocytosis X and such conditions as Niemann-Pick's and Gaucher's diseases?

Dr. Mantz: These are still generally regarded as true lipid storage diseases which are due to an inborn error of lipid metabolism, resulting in the piling-up of large quantities of lipid in reticuloendothelial cells. In Niemann-Pick disease the stored lipid is largely sphingomyelin, while in Gaucher's disease it is a cerebroside. In the Hand-Schüller-Christian syndrome, cholesterol deposition in the proliferated reticuloendothelial cells is prominent; but according to Lichtenstein the cholesterol analogue of Niemann-Pick's and Gaucher's diseases is not the Hand-Schüller-Christian syndrome, but xanthoma tuberosum multiplex. In other words, histiocytosis X differs fundamentally from these storage diseases.

Dr. Diehl: The sternal puncture specimen, as I recall, contained a few foamy macrophages and more than the expected number of eosinophils. Do you suppose this represents diffuse involvement of the marrow, or did the needle enter a localized lesion by chance?

Dr. Mantz: The x-rays show no rarefaction of bone at the site of the sternal biopsy, but still an

early eosinophilic granuloma may be present in this region. I don't think your question can be answered on the basis of a single puncture.

Dr. Stowell: Dr. Olson, what treatment is this child receiving?

Dr. Olson: We considered that the multiplicity of the lesions contraindicated enucleation or any other surgical procedure. At present, x-ray is the only therapy we plan to use.

Dr. Tice: We contemplate giving the child approximately 1,000 roentgens over each area involved: skull, ribs, pelvis, and femurs. The dosage to each region must be delicate'y adjusted, and we have been careful to warn the parents that the boy will lose his hair temporarily. I cannot recall having seen an eosinophilic granuloma fail to respond to x-radiation, and I think we can confidently expect considerable regression, although I must admit I am extremely doubtful of permanent cure in this case.

Dr. Helwig: Dr. Tice, isn't there a chance that 1,000 roentgens, given through each of several ports, will damage bony epiphyses and lead to arrest of bone growth?

Dr. Tice: Yes, unless adequate care is used to shield the epiphyses from the radiation. Also, great pains must be taken to prevent injury to the gonads when the pelvis is irradiated.

Dr. Boley: The biopsy which Dr. Helwig has discussed was the second taken from this patient. The first, also of a skull lesion, showed nothing suggestive of an eosinophilic granuloma; it consisted solely of fibrous tissue which was somewhat more vascular than one expects in scar tissue. At the time this first specimen was taken, the child had received no x-ray or other definitive therapy. Hence, these lesions can undergo spontaneous involution; and if this is so, it improves this patient's prognosis considerably. Some such process must have been responsible for the spontaneous cure in the case that Dr. Mantz mentioned.

Dr. Stowell: This is an encouraging observation, at least so far as this particular patient is concerned.

This case has been presented as an example of a condition which must be considered in the differential diagnosis of multiple radiographic defects of bone.

Reference

1. Lichtenstein, L.: Histiocytosis X, *A.M.A. Arch. Path.* 56:84 (July) 1953.

One good sneeze can send 20,000 infection-laden droplets shooting as far as 12 feet, at a speed of 150 feet per second. Even after half an hour, cautions the Kansas State Board of Health, 4,000 of them will still be in the air.

PHYSICIANS' ACTIVITIES

Dr. James T. Moy has returned to practice in Wichita after completing a course in cardiovascular disease at Harvard Medical School.

Dr. and Mrs. C. Omer West, Kansas City, are enjoying a trip abroad with a stop in Istanbul, Turkey, to attend the 11th General Assembly and the 30th Council Session of the World Medical Association.

A talk on "Surgery for Peptic Ulcer" was given by **Dr. Lloyd W. Reynolds**, Hays, at a recent meeting of District 9 of the Kansas State Nurses' Association.

Dr. James J. Basham, Fort Scott, has been named health officer of Bourbon County, succeeding **Dr. J. R. Pritchard**, Fort Scott, who had previously accepted a temporary appointment.

Plans to move to Detroit, Michigan, were announced recently by **Dr. Lawrence E. Filkin**, who has practiced in Concordia since 1946. He will be practicing in the medical division of the Ford Motor Company in Detroit.

Dr. Rodger A. Moon, Kansas City, served as moderator of a discussion on mental health at a Camp Fire Girls conference at Lake Quivira last month.

An announcement was made recently by **Dr. William V. Hartman**, Pittsburg, that he will move to St. Louis. He had practiced in Pittsburg for 45 years.

Dr. William R. Jones, Canton, went to Detroit, Michigan, recently to take part in a postgraduate program offered by Parke-Davis and Company.

Dr. Harry Lutz, Augusta, discussed the Butler County health program at the annual Butler County Teachers' Institute in El Dorado at the opening of school.

"The Present Status of Our Knowledge About the Group of Schizophrenias" was the subject studied at the Second International Congress for Psychiatry at Zurich, Switzerland, last month. One of the participants was **Dr. Karl Menninger**, Topeka.

Dr. James B. Pretz, Kansas City, spoke on "Rest and Fatigue" at a public meeting at Donnelly College,

Kansas City, recently. His discussion was one of a series on the subject of "Improving the Health of the Community."

A ten-week trip to Europe was concluded recently by **Dr. Edward J. Grosdidier**, Kansas City. He was accompanied by Mrs. Grosdidier and their three daughters.

Dr. DeMerle E. Eckart, Hutchinson, has received word from the National Institute of Health that a progress report of his theory entitled "A Wave Theory of Nervous System Function" will be included in its collection of developments in the field of psychopharmacology.

A talk, "Education for Childbirth" was given by **Dr. Gerhart R. Tonn**, Wichita, before the Sedgwick County Medical Assistants' Society at its September meeting.

Dr. Clarence H. Benage, Pittsburg, was made a fellow of the International College of Surgeons at a convocation held in Chicago in September.

Dr. Robert W. Hughes and **Dr. Wendale E. McAllaster**, Russell, who have been spending three afternoons a week practicing in Natoma, have announced plans to discontinue the Natoma practice, effective October 1.

"Fractures and Dislocations of the Cervical Spine" was the subject of a paper presented by **Dr. John F. Thurlow**, Hays, at a meeting of the Kansas Chapter, American College of Surgeons, on September 15. **Dr. Charles Isaac**, Newton, spoke on "Urological Anomalies Coming to Surgery."

Dr. Victor G. Henry, Jr., Newton, discussed hypnosis before a recent meeting of the Harvey County Medical Assistants' Society.

Plans to close his office in Douglass have been announced by **Dr. Frederick F. Lemon**, who will spend the winter in Salina with a daughter.

Dr. Maurice A. Walker, Kansas City, was the subject of a feature story published in the *Kansas City Kansan* on September 15.

Declining mortality from tuberculosis since 1900 has had its greatest impact among young adults (ages 15-44) in the peak income and childbearing years, according to Health Information Foundation. The highest mortality from this disease now occurs in the upper age grades among those over 65.

COUNTY SOCIETIES

The Sedgwick County Medical Society began its 1957-1958 year with a golf and skeet tournament, followed by a banquet, at the Rolling Hills Country Club, Wichita, on September 20. The first scientific program of the season was presented on October 8.

Dr. William V. Hartman, who had practiced in Pittsburg for 45 years before moving to St. Louis, was guest of honor at a dinner meeting of the Crawford County Medical Society last month. Wives of members were also guests, making an attendance of 60. Dr. Clarence H. Benage served as toastmaster and presented a gift from the group.

A special meeting of the Leavenworth County Society was held in Leavenworth recently to discuss plans for administering vaccine for Asian influenza. The group voted to follow the priority system outlined by the United States Public Health Service, allocating the first supply of vaccine for hospital workers, then police, fire and transportation workers, and, third, essential industrial workers.

Residents of Washington County were guests of the medical society there on September 17 for a special showing of the Smith, Kline and French Laboratory film, "Mongana," a record of the daily experiences of a medical missionary and his family in the heart of Africa.

A joint meeting of the Wyandotte County Medical Society and the Wyandotte County Bar Association was held at the Town House, Kansas City, on September 17. The program was devoted to medical, engineering, and legislative aspects of the traffic accident problem.

Physical examinations for members of the Leavenworth High School R.O.T.C. unit and football squad were given last month by 20 members of the Leavenworth County Medical Society. Approximately 200 youths were examined.

The first fall meeting of the Shawnee County Society was held in Topeka on September 3. Dr. Otto Hanson spoke on "Clinical Uses of Radioisotopes." At the business session the group approved single memberships in Blue Cross-Blue Shield for students at Washburn University, approved a reduction in membership fee for physicians in residency training, and elected one physician to membership, Dr. Lewis Wesselius of the Menninger Foundation.

Three Neodesha physicians were elected as officers of the Southeast Kansas Medical Society at a meeting held in Chanute last month. Dr. Charles E. Stevenson was named president, Dr. Frank A. Moorhead, vice-president, and Dr. Glen M. McCray, secretary-treasurer. Dr. Michael Bernreiter, Kansas City, Missouri, was guest speaker.

Dr. Barrett A. Nelson, Manhattan, president of the Kansas Medical Society, addressed the Iroquois Medical Society at a meeting held in Meade on September 9. Members of the Auxiliary were also guests of the medical society.

Members of the Cherokee County Medical Society were guests of the Cherokee County Bar Association at a dinner meeting held in Baxter Springs last month. A film, "The Medical Witness," was shown.

Dr. Vernon M. Lockard, radiologist at Mercy Hospital, Independence, was speaker at a meeting of the Montgomery County Medical Society in Coffeyville last month. His subject was "Cancer of the Cervix."

To Hold Hertzler Memorial Symposium

The first annual Hertzler Memorial Symposium will be held at the Hertzler Clinic, Halstead, on Saturday, November 2. The program will be devoted to a study of thyroid disease. A social hour at 5:00 o'clock will be followed by a buffet supper at 6:00 and a panel discussion at 7:00. All members of the Kansas Medical Society are invited to attend, and advance reservations are requested.

Participants in the discussion will be: Dr. Christian A. Hellwig, Dr. Victor E. Chesky, and Dr. Emmett N. McCusker, all of the Hertzler Clinic; Dr. Arthur Grollman of Southwestern Medical School, Dallas; Dr. Edward Hashinger of the University of Kansas School of Medicine, Kansas City; Dr. George Clayton of Baylor University, Houston; Dr. D. L. Tabern, head of Division of Radioisotopes, of Abbott Laboratories; Dr. Homer L. Hiebert, Topeka, and Dr. Frank E. Hoecker of the University of Kansas, Lawrence.

In 1900 influenza and pneumonia took a toll of 80 persons per 100,000 population in the young adult ages (15 to 44), according to Health Information Foundation. By 1955 mortality from these causes had dropped to around 4 per 100,000 persons in the same age group.

One accident can cost you your license. Can you afford a chauffeur?

ANNOUNCEMENTS

Second Cruise Congress, Pan American Association of Ophthalmology, on board *S. S. Queen of Bermuda* with one day each in Puerto Rico, the Dominican Republic, Jamaica, Haiti and Nassau, February 1-14, 1958. Reservations may be made through Mr. Leon V. Arnold, 33 Washington Square West, New York 11, New York.

Part I examinations for candidates for certification by American Board of Obstetrics and Gynecology, various parts of U. S. and Canada, January 2, 1958. For information write the secretary, Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6, Ohio.

The Sister Elizabeth Kenny Foundation announces a continuance of its postdoctoral scholarships to promote work in the field of neuromuscular diseases. Each grant provides a stipend of from \$5,000 to \$7,000 a year for a five-year period. Write Dr. E. J. Huenekens, 2400 Foshay Tower, Minneapolis 2, Minnesota.

Intensive course in radioactive isotopes offered by Department of Radiology, New York University Post-Graduate Medical School. May be entered the first of any month during academic year. For internists, radiologists, and hematologists. Tuition is \$150. Write Associate Dean, 550 First Avenue, New York 16, New York.

American Goiter Association offers Van Meter Prize Award of \$300 and two honorable mentions for best essays on problems relating to thyroid gland. Deadline February 1, 1958. Write the secretary, 149½ Washington Avenue, Albany 10, New York.

Courses offered in December by New York University-Bellevue Medical Center: December 2-4, Recent Advances in Diagnosis and Treatment of Poisonings; December 2-4, Infertility; December 2-6, Surgery of the Cornea; December 2-14, Bronchoesophagology and Laryngology; December 2-6, Pediatric Cardiology.

American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois, offers three prizes, \$500, \$300, and \$200, for best essays on any phase of the diagnosis and treatment of chest disease (heart or lungs). Closing date April 15, 1958.

Fourth International Conference on Goiter, sponsored by London Thyroid Club and American Goiter Association, London, England, July 6-8, 1960. A

few honoraria available for travel assistance. Write Dr. John C. McClintock, 149½ Washington Avenue, Albany 10, New York.

BLUE SHIELD

Ever since the birth of the "Blues," the big news has been their astounding rate of growth. Blue Cross and Blue Shield have "hit the jackpot" in public acceptance. Blue Cross is now well past the 50 million mark, and Blue Shield expects to pass 40 million by the end of 1957.

Occasionally one hears the suggestion that Blue Shield attempt to "stabilize" its enrollment and relax its efforts to cover an ever larger cross section of the population. But the demand for prepaid medical care is now almost universal; and those who have it are asking for broader coverage and better contracts.

Not only does Blue Shield's momentum of growth permit no turning back, but it has grown so big that public interest in Blue Shield has made it a major item in America's program for social progress. The continued growth of Blue Shield is essential to the best interests of both medicine and the public.

Why essential?

First, because Blue Shield is a major factor in medicine's economy. Whereas installment buying creates a debt and mortgages the future, medical prepayment creates a credit for the patient, and protects his future.

Again, Blue Shield's growth safeguards its actuarial base of operations. As risks are spread ever more widely, the community and the doctor gain a surer protection against fluctuations affecting the subscription rates or payments to physicians.

A third benefit of Blue Shield growth is the opportunity to reduce operating costs per person enrolled. This helps the plan to broaden its services or to raise its payments to doctors—or both.

Fourth, the greater the number of his patients covered by prepayment, the fewer for whom the doctor has a collection problem, and the lighter his load of free or part-pay work.

Medicine's most significant benefit from the growth of Blue Shield is the dominant influence of the medically guided Blue Shield Plans on the shape and destiny of the voluntary health insurance movement as a whole. Were it not for Blue Shield, the medical profession would have no effective control over the basic economy of private practice.

Blue Shield is big because it has a big job to do for the doctor and his patient. But the size of Blue Shield is only a reflection of the vision and boldness that the American doctor has brought to bear on this job.—Taken from *Medical Journal Editorial Service*.

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permits high dosage,
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Laboratory studies demonstrate that Searle's new oral diuretic, Rolicton, causes positive diuresis with an essentially balanced excretion of water, sodium and chlorides.

Settel¹ studied the effect of Rolicton in forty-seven patients and found no serious side effects. Assali, who observed the action of Rolicton in five patients with severe toxemia of pregnancy, states² that side actions are essentially nonexistent. Side actions of such low incidence, together with its diuretic efficacy, suggest a high order of usefulness for Rolicton.

One tablet of Rolicton, b.i.d., is usually adequate to maintain patients free of edema after the first day's dosage of four tablets. Some patients respond well to one tablet daily. G. D. Searle & Co., Chicago 80, Illinois. Research in the Service of Medicine.

1. Settel, E.: Rolicton[®] (Aminoisometradine), a New, Nonmercurial Diuretic, *Postgrad. Med.* 21:186 (Feb.) 1957.

2. Assali, N. S.: Personal communication, May 28, 1956.

SEARLE

Normal glomerulus, showing arteriole musculature, glomerular epithelial podocytes, and "epitheloid" muscle cells of vasa efferens.

The Adenoviruses

Their Relationship to Acute Respiratory Infections

WAYNE E. FRAZIER, M.D., *St. Petersburg, Florida*

Respiratory diseases, according to several surveys, constitute the most common cause of illness in various population groups in this country. In the great proportion of cases, this large group of respiratory infections is of undetermined etiology, with known bacterial, fungal, and viral agents causing only a relatively small number of the total illnesses.¹¹

The problem of classification of various infections of the respiratory tract is indicated by the large variety of names given to illnesses included within this group. Among these respiratory diseases of unknown etiology are the common cold, nasopharyngitis, laryngitis, common respiratory disease, grippe, catarrhal fever, febrile catarrh, acute respiratory disease, tracheitis, bronchitis, and primary atypical pneumonia. Many of these terms have arisen from the prominence of certain symptoms or signs at specific sites of the respiratory tract, and they are of only limited value in defining separate entities. The picture is confused by the fact that different agents may produce the same clinical type of illness, while a single agent may induce variable clinical manifestations resembling almost any of the common respiratory tract diseases.^{11, 42}

Recently, through the work of several groups of investigators studying this important problem, a new group of viruses has been discovered inhabiting the respiratory tract. These viruses have been proved to be etiologically related to certain of the clinical syndromes of respiratory tract disease which fall in the large class of those of undetermined cause. The newly-isolated viral agents, however, do not have any apparent causal relationship with the common cold by clinical, serological, and epidemiological studies.

Terminology has been an obstructive problem with this new group of viruses, with clarification arriving only recently, in May of 1956. At that time, the early investigators and others interested in this field met to discuss a solution to the difficulty of nomenclature.¹⁴ Prior to this date, each separate group of investigators who had isolated and studied

members of the group of viruses named them independently. To add further to the confusion, the workers ordinarily used abbreviations of the names when discussing their own specific viral agent. Thus, terms such as "adenoidal degenerating" (AD) agents, "acute respiratory disease" (ARD) viruses, "respiratory infection" (RI) viruses, and "adenoidal-pharyngeal-conjunctival" (APC) viruses appeared in research reports. One virologist even suggested that the group should be called the "Hudihi or Hidihi" viruses, to recognize the work of Huebner, Dingle, and Hilleman in this field.⁴²

To standardize the nomenclature, various interested men studying these agents agreed on the new term of "adenovirus group" for a collective name. This designation indicated both the characteristic involvement of lymphadenoid tissue and the tissue of first reported isolation.^{14, 42} Although the committee which agreed on the name had no official status in matters of nomenclature, the term was accepted among investigators most concerned with the work.

Discovery of the Adenoviruses

During World War II, the Commission on Acute Respiratory Diseases of the Army Epidemiological Board described an acute febrile respiratory infection in recruits. This illness was differentiated from other common respiratory diseases, such as the common cold, streptococcal pharyngitis and tonsillitis, and primary atypical pneumonia, by clinical symptomatology and immunological studies. The disease entity, termed "acute respiratory disease" (ARD) was considered to be caused by a viral agent, but isolation of a virus in experimental animals and chick embryos was unsuccessful.

In 1945, transmission studies in human volunteers were performed, using as inocula the filtered secretions of the respiratory tract from donors with symptoms of common respiratory diseases. It was found that ARD was transmissible, having an average incubation time of five to six days. The importance of this influenza-like syndrome, which occurred in epidemic fashion in the military population, stimulated further investigation of the disease.

An epidemic of ARD occurred at Fort Leonard Wood, Missouri, during the winter of 1952-1953. There were many patients with influenza "A" and also a number of patients with clinical and x-ray

This is one of a group of theses written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Frazier is now serving his internship at Mound Park Hospital, St. Petersburg, Florida.

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findings of primary atypical pneumonia during the period of the ARD epidemic. Hilleman and co-workers^{20, 22} isolated five cytopathogenic agents from certain non-influenzal cases at the Army post. One of these agents, isolated in HeLa cell culture from a patient with primary atypical pneumonia (Case 67), was designated as the respiratory infection agent No. 67 (RI-67). This new agent was studied in tissue culture, tested serologically, and inoculated into laboratory animals. The workers demonstrated immunologically that the RI-67 agent differed from other virus groups which cause respiratory infections. They also showed that during the epidemic patients with respiratory symptoms not caused by influenza virus developed an increase in titer to the RI-67 virus.

Further studies with the RI-67 agent were reported by Dingle and others¹⁹ in 1954. They demonstrated that the agent was related to cases of ARD that had occurred in recruits at various Army posts during World War II. These workers performed serological studies with sera from these recruits, which had been stored since the time of their illness in 1942-1945. They concluded that ARD was apparently a distinct clinical entity, with a viral agent as the presumed cause, and that RI-67 might be the principal etiologic agent for ARD.

Meanwhile, in 1953, another group of investigators (Rowe and others)³⁶ reported the isolation of a new cytopathogenic agent from human adenoid tissue. The workers had obtained the tissue from hospital operating rooms following adenoidectomies. They had planned to use the tissue for culture purposes. To their surprise, however, the adenoid tissue underwent spontaneous degeneration in a period of days without ever being inoculated with viral agents. In addition, transfer of culture fluids from the adenoids showing degeneration to fresh tissue cultures would result in characteristic cytopathogenic changes. These changes differed from those produced by other human viruses when inoculated into tissue cultures.

Further studies indicated that the agent was probably a virus, and the investigators proposed the name "adenoidal degeneration" (AD) agent. At this time, the relationship of the newly discovered virus to clinical disease was unknown. Further research was undertaken, therefore, to determine the possible role of the AD virus in human disease, particularly in upper respiratory tract infections.

The group of investigators at the National Microbiological Institute²⁴ found that many strains of respiratory-system viruses, isolated from nasopharyngeal and conjunctival secretions and feces of persons with respiratory illnesses, were biologically and sero-

logically related to their previously-discovered AD agent. They were able to segregate the 143 strains of the virus into six types, immunologically, and demonstrate human antibody responses to all six types.³⁵ These workers felt that the term "adenoid-degenerating" agent, which they had proposed originally, was now inadequate. Therefore, they designated these new viruses as "adenoidal-pharyngeal-conjunctival" agents, to indicate the important anatomic sites in which they had been found.

Continuing their investigation of these viruses, they were able to demonstrate by epidemiologic studies that viruses of all six types produced frequent infections in man. In particular, the Types 3 and 4 viruses were incriminated as causing specific respiratory illness. They found that the RI-67 agent isolated by the Hilleman group²⁰ was a Type 4 virus, apparently responsible for cases of acute respiratory disease and primary atypical pneumonia in military personnel.

Thus, intensive activity in this field by workers at National Institutes of Health resulted in an interesting finding. A group of viruses, discovered and propagated without any definitely known relationship to disease, was later demonstrated to be related to a previously described clinical syndrome, by epidemiologic studies.⁴⁰

Clinical Manifestations

The clinical features of illness produced by infection with an agent of the Adenovirus group are multiple and variable. Signs and symptoms differ somewhat, depending upon the specific Adenovirus type etiologically involved. Also, as in any illness, only certain features will be present in any one case. Therefore, a composite clinical picture, as compiled by Dascomb and Hilleman from 45 cases hospitalized at Fort Dix, New Jersey,⁸ will be presented.

1. Constitutional features: fever, malaise, myalgia, chills, erythema, headache, anorexia, dizziness.
2. Eye, ear, nose, throat: pharyngitis with sore throat, pharyngeal exudate, rhinitis, conjunctivitis, otitis, lymphadenopathy.
3. Respiratory: cough, tracheobronchitis, chest pain, laryngitis, dyspnea, pneumonitis.
4. Gastrointestinal: abdominal pain, nausea, vomiting.

The clinical picture resulting from infection by the Type 3 Adenovirus was sufficiently striking as to be designated by a specific name. Bell and associates⁴ termed a communicable disease entity, which they described and studied in 1954, "pharyngoconjunctival fever." Common findings in the disease are fever, pharyngitis, conjunctivitis, and cervical lymph-

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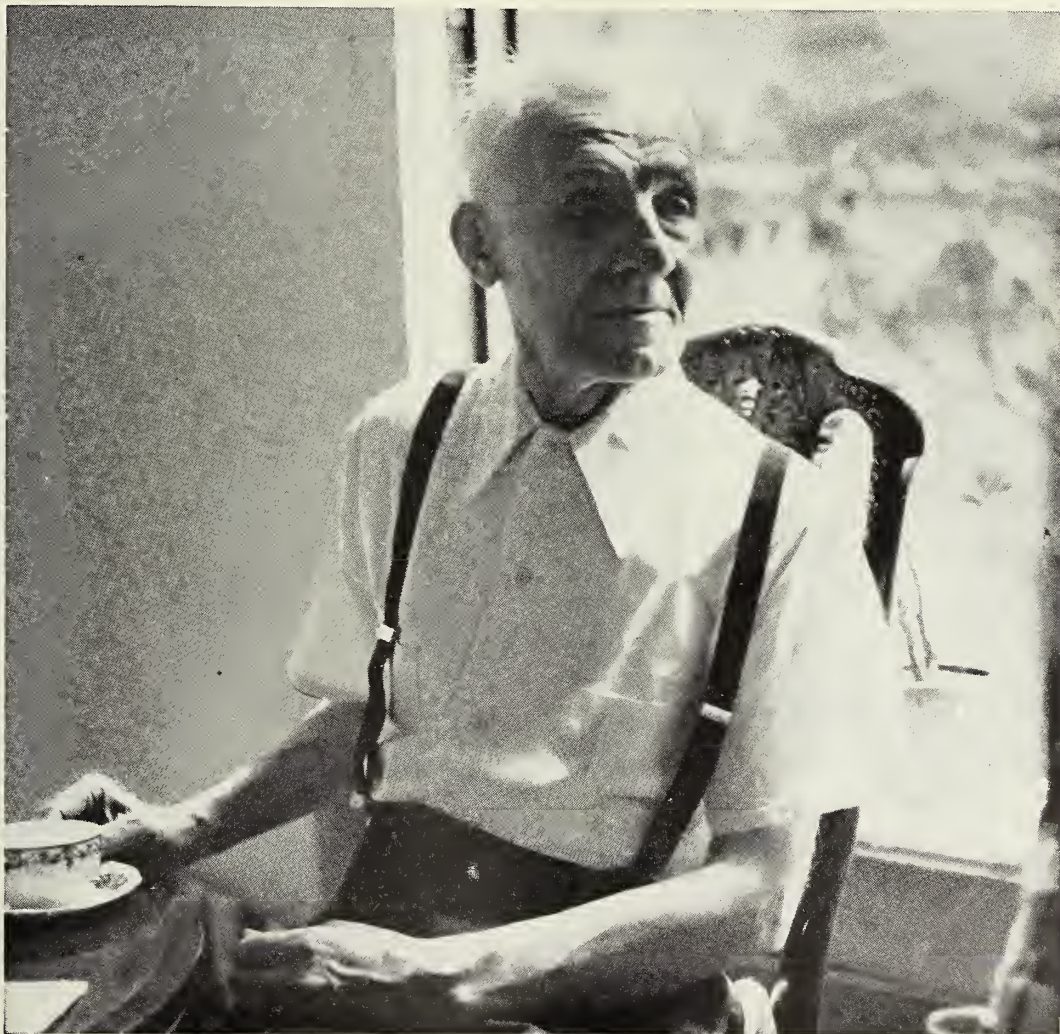
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adenopathy. The febrile course usually lasted from five to seven days, with the temperature often spiking to 104 degrees Fahrenheit. Conjunctivitis was frequently monocular, with congestion of the palpebral and bulbar conjunctivae, itching and burning sensations, and conjunctival lymph follicle hyperplasia. The disease occurs most commonly in children. It is apparently highly communicable, with cases occurring in epidemic form from contact in swimming pools.^{6, 7, 30, 31, 37}

The Type 4 Adenovirus has been shown to be causally related to the entity termed "acute respiratory disease"²⁴ in the large proportion of such cases. This infection is an acute, febrile illness characterized by constitutional symptoms of feverishness, chilliness, malaise, headache, and anorexia. In addition, respiratory symptoms of irritated throat, hoarseness, cough, and nasal obstruction are frequently present. Physical findings that are demonstrable include pharyngeal injection, pharyngeal lymphoid hyperplasia, and cervical lymphadenopathy.^{11, 16, 17} Patients who are ill with the ARD syndrome usually have the acute episode for three to seven days, often followed by a convalescence period of one to two weeks.

Acute respiratory disease has been found, also, to be associated with Type 7 of the Adenovirus group.¹⁵ The most common presenting features in the epidemic reported by Dascomb and Hilleman⁸ were fever, pharyngitis, and non-productive cough. However, the signs and symptoms of ARD, as described in cases caused by the Type 4 Adenovirus, also have been observed in patients suffering with the Type 7 virus infection.

Although conjunctivitis is a common feature of infection with the Type 3 Adenovirus¹⁵ (pharyngoconjunctival fever), this clinical finding is also associated with infection by the Type 6 Adenovirus.²⁶ A specific eye infection, occurring in epidemic form and termed epidemic keratoconjunctivitis (EKC), was found to be caused by an Adenovirus (Type 8) by Jawetz and his associates.²⁸ This distinct clinical entity is characterized by a severe keratitis with round subepithelial corneal opacities. In addition, EKC differs from Types 3 and 6 infections by the absence of respiratory symptoms.

The clinical syndrome designated as "primary atypical pneumonia of unknown etiology" has been proved in many cases to be caused by a member of the Adenovirus group. For example, the RI-67 viral agent was originally isolated from a patient exhibiting the clinical and x-ray findings of primary atypical pneumonia. This virus later was discovered to be a member of the Type 4 Adenovirus group. Thus, the clinical picture of primary atypical pneumonia probably can be produced by infection with several different viral agents, including the Adenoviruses.

One such agent has been designated as the PAP virus, first isolated in 1944. There is no serological cross-reaction between the PAP virus and the Adenoviruses. Also, the PAP virus induces cold agglutination and Streptococcus MG agglutination, tests which are negative for the Adenoviruses.

Reimann³² proposes that the term "viral pneumonia" be used for pulmonary lesions caused by such agents as the Adenoviruses rather than the ambiguous and negative term of "primary atypical pneumonia of unknown etiology." He feels that the various infections of the respiratory tract by viruses (PAP, Adenoviruses, etc.) have their own spectrum of severity, ranging from the inapparent or mild attacks, which are most common, to the occasional viral pneumonia.

Laboratory Studies

Since clinical features of illness produced by the Adenoviruses resemble findings that are caused by other agents, the ultimate word for the diagnosis of infection by one of the Adenovirus group is determined by the laboratory.

The cardinal attribute of the Adenovirus group is a common antigen that is demonstrable by complement fixation test.³⁴ This antigen is not shared with other known viruses, nor do other known infections produce complement fixing antibody against the antigen. The titer of this antigen is determined by testing with a pool of human convalescent serums which have a high titer of complement-fixing antibody to the group antigen.

The specific virus type of the Adenovirus group is identified by the neutralization test. The new serotypes are established by using hyperimmune rabbit antisera for testing.³⁴ When an Adenovirus that is unclassified is found to be serologically distinct from all existing types, it is placed as a new specific viral type. At present, by utilizing the neutralization test, 12 distinct Adenovirus types have been established from human sources and two from simian materials.^{34, 41} In addition, several other Adenovirus strains are known which have not been placed in present classification of 14 serological types. These strains await completion of reciprocal neutralizing antibody titrations before their qualifications as additional serotypes can be evaluated.

There are other properties of the Adenoviruses which can be demonstrated in the laboratory. These viruses are resistant to ether, sulfonamides, and antibiotics, but they are destroyed by heating for 30 minutes at 56 degrees Centigrade. They are non-pathogenic for all laboratory animals studied (mice, guinea pigs, and rabbits), using several routes for inoculation of the animals with the viruses.^{26, 37}

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An important characteristic of these viruses is their exhibition of cytopathogenicity. This capacity to injure or destroy susceptible cells in which they are multiplying is not unique to the Adenovirus group, but is seen in many viral species growing in tissue culture. The presence of viral agents, therefore, can be determined by a more rapid and convenient manner than by using laboratory animals. In addition, the infectivity of virus suspensions and identification of their specific antibodies can be measured by the amount of cell degeneration caused by the virus.¹³

Observation of this trait of cytopathogenicity in uninoculated cultures of adenoid tissue by Rowe and associates³⁶ resulted in the isolation of agents of the Adenovirus group. Since that time, a large number of Adenovirus strains have been isolated in tissue cultures of various human and monkey tissues by a number of workers, from a variety of clinical respiratory syndromes.³³

In studying the cytopathogenicity of these respiratory viruses, the HeLa carcinoma cell cultures, trypsinized monkey kidney cultures, and explant cultures of human embryo epithelium have generally been used. The HeLa cells are particularly sensitive to the injurious effects of these viruses. Focal areas of injured cells appear in the culture tube, usually at the periphery of the tissue cell sheet. As the cell changes spread toward the center of the sheet, the cells round-up and fuse into highly refractile clumps which peel off the glass tube and float in the culture fluid. The injured cells are granular in appearance and lacking in outline, and many exhibit densely staining nuclei.¹³

Harford and associates¹⁹ studied cytopathogenic effects of the Adenoviruses on HeLa cells by electron microscopy. They noted that the cytoplasm of the infected cells contained increased numbers of dense osmophilic granules composed mainly of lipid which they considered to be products of mitochondrial degeneration. The nuclear changes revealed numerous clusters of virus-like particles in the infected cells. These particles were small and somewhat ovoid in shape (30 x 50 microns). They were usually arranged in rows within a cluster, suggesting crystal formation.

Dingle and his co-workers¹² made some interesting observations concerning the characteristics in tissue culture of one member of the Adenovirus group (designated formerly as AD Type 3 virus). It was noted by these investigators that the virus was adsorbed to the HeLa cells at a relatively slow rate and did not spread readily from infected to non-infected cells. Also, their experiments demonstrated that only a small percentage of the viral

agent was liberated from the cells in which it propagated. They postulated that these properties of inefficient adsorption and poor dissociation of the viruses might explain the limited spread of this agent to susceptible hosts.

They also found that infected HeLa cells would continue to carry out active metabolism even though supporting viral multiplication. These cells continued to utilize glucose even with marked pathologic changes observable. The viral-infected tissue culture tubes showed increased acidity as compared to the non-infected tubes. Thus, infection with the virus would institute marked cytopathologic effect but apparently did not result in cell death. This finding is compatible with the clinical picture of a self-limited disease produced by the viral agent.

Epidemiology

The original epidemiological studies, performed in connection with the diseases caused by the Adenoviruses, were undertaken by the Commission on Acute Respiratory Diseases during World War II. The work of the commission with the entity termed ARD, later shown to be caused by Adenovirus Types 4 and 7, laid the groundwork for the rapid acquisition of knowledge about this new group of viruses, once isolation of the agents had begun.

The Type 3 Adenovirus, the causative agent of pharyngoconjunctival fever, has been extensively studied from an epidemiological standpoint. The original investigators⁴ who named the disease reported that there was an incubation period of five to six days preceding the onset of illness. During the first few days the illness is highly communicable, but this decreases to practically nil after the ninth day.

The true prevalence of the disease is unknown. This clinical entity occurs in localized epidemic and sporadic form in all age groups (mostly children) and in both sexes. Bell et al. felt that carriers were not an important source of infection. They also suspected that contaminated swimming pools might be a source of infection for pharyngoconjunctival fever.

Further investigation by other workers^{7, 30} has helped to find the role of the swimming pool in transmission of this disease. Cockburn⁶ described an epidemic of conjunctivitis associated with pharyngitis, cervical lymphadenopathy, fever, and myalgia, which occurred in Greeley, Colorado, in the summer of 1951. No etiologic agent was discovered at that time. A history of swimming in the local pool, or direct contact with someone who had been swimming there, was obtainable in most cases. The attack rate among swimmers was estimated to be 25 to 50 per cent. Using paired sera that had been stored

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from the 1951 Greeley outbreak, Cockburn and associates⁷ were able to determine by serological testing that Type 3 Adenovirus was apparently the causative agent in the epidemic. The clinical features of the cases in the Greeley epidemic closely resembled those described in 1955 for pharyngoconjunctival fever.

Other outbreaks of this disease occurred in Washington, D. C., in 1954 and in Toronto, Canada, in 1955. The swimming pool was also implicated in these epidemics. The Canadian city's outbreak, as reported by Ormsby and Aitchison,³⁰ followed the pattern of the one in Greeley. The onset of symptoms occurred within 6 to 10 days after swimming in the city's pools. The disease was transmitted, in many cases, by direct contact with other persons. In some families all persons developed the disease, including the parents. The Type 3 virus was isolated in this epidemic also.

An interesting epidemiological study was performed by Ward and his co-workers in 1955.³⁹ They inoculated a group of young male volunteers, ages 21 to 25, on the conjunctiva of one eye and on the posterior pharynx, using either Type 3 or 4 Adenovirus. These workers found that illness indistinguishable from pharyngoconjunctival fever was produced in the volunteers. Racial differences among the men apparently did not affect the clinical response.

Additional studies of Adenoviruses in volunteers were carried out by Bell and others.² Using Types 1, 2, 3, 4, 5, or 6 for intranasal instillation, and Type 4 virus for swabbing of the oropharynx, the investigators were able to produce infection, as demonstrated by complement-fixing antibody response. Both infection and illness were produced in volunteers by swabbing the conjunctiva with Adenovirus Types 1, 3, 4, or 5. Volunteers developed a moderately severe self-limited, catarrhal conjunctivitis associated with systemic symptoms similar to those of pharyngoconjunctival fever.

Infection with Adenovirus Type 4 (prototype RI-67) constitutes a problem of considerable importance among new recruits in the armed forces. In some epidemics, as many as one-third of the recruit population has been hospitalized during the winter months with the ARD syndrome. Second outbreaks did not occur in the involved units, so immunity seemed to follow the infection.⁹ In one study reported by Hilleman and associates²³ of an epidemic at Fort Dix, New Jersey, in the winter of 1954, there was a significant rise in antibody titer to the RI-67 virus in over 75 per cent of the new men, during the first eight weeks. These workers felt that a reservoir of infection was present in the human population, with possible activation of latent virus from healthy per-

sons. Infection with the Type 4 agent most commonly occurs during the middle years of life, with the highest incidence between ages 18 and 25, according to one study.²¹

Adenovirus infections in the civilian population are common, as determined by serological studies on various age groups. There is serologic evidence that one-third of the population may acquire infection with the Type 6 Adenovirus before age 45 is reached.²⁶ In the study by Gness and others¹⁸ on random blood specimens, it was found that antibodies to the Adenovirus group were present in high titer, and prevalent in a large percentage of the sera tested. It is unknown, as yet, whether the majority of persons undergo the infection during epidemic spread of the virus, or whether its endemic presence results in sporadic infections leading to type-specific immunity.²⁷

Although much of the epidemiological study of the Type 4 Adenovirus (RI-67) was performed in the armed forces, there have been studies with the civilian population. One of the most interesting of such studies related to the inoculation of 14 volunteer adult patients suffering from advanced cancer.³⁸ These patients were inoculated by the respiratory route (nine of the patients) or parenterally. This experiment was performed in 1954, and it was one of the early attempts to transmit the RI-67 agent to produce disease in the recipient. The investigators found that neutralization and complement fixation antibody appeared or increased in amount in all inoculated patients who survived for at least nine days after injection. None of the volunteers developed significant illness, however. They observed no convincing evidence of cancer regression or selective localization of the virus in the cancer tissue.

A group of investigators attempted to determine the prevalence of respiratory infections produced by the RI-67 agent in a large city, using serologic testing for the epidemiological work. They found that the RI-67 virus (Type 4 Adenovirus) had apparently not produced many of the respiratory infections in that city. Instead, another viral agent which they termed the JL virus seemed to have been associated with the syndromes classified as ARD and non-streptococcal pharyngitis. Immunologically, this JL agent was determined to belong to the Type 3 Adenovirus group.

Balducci et al.¹ performed epidemiological studies in England during 1954 and 1955 to determine the presence of Adenovirus infection in that country. They found that complement-fixing and neutralizing antibodies against the Adenoviruses were widely distributed in sera collected in northern England. These workers also were successful in isolating

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viruses from human adenoid tissue and identifying these agents as members of the Adenovirus group. Their work also confirmed American studies as to the prevalence of the complement fixing antibodies and the age at which they are found. They did not find the high incidence of infection of soldiers that Hilleman found in United States military personnel.

Treatment and Prevention

Little success has attended the search for drugs or other measures that will cure viral diseases, such as those caused by the Adenovirus group. Ryan, O'Rourke, and Iser³⁷ found no clinical or tissue culture response to the known antibiotics or sulfonamides, by the agent of pharyngoconjunctival fever. However, they did obtain a rapid abatement of signs and symptoms in most patients by using a combination of topical corticosteroid and antibiotics or sulfas. They noted no exacerbation of the disease with cortisone therapy.

Likewise, Dascomb and Hilleman⁸ found that Terramycin did not influence the disease course produced by infection with an agent of the Adenovirus group. Symptomatic therapy for their patients included steam inhalation and analgesic doses of codeine, to reduce cough intensity. In addition, bed-rest, aspirin, and adequate intake of fluid were advised. These workers also suggested that local anesthetics and opiates might be of benefit, although they did not use these in their patient study.

Dingle⁹ suggests that selective passive immunization of new recruits with human gamma globulin might help prevent or reduce epidemics which result in the loss of numerous man-days of training in the military forces.

The greatest potentiality for prevention of such epidemics, however, is through the avenue of active immunization. To this end, Adenovirus vaccines have been prepared and studied in volunteers. The first such study was reported by Bell, Huebner, and their group of investigators at the National Institutes of Health.^{2, 25} They prepared heat-inactivated and formaldehyde-inactivated vaccines against Type 3 Adenovirus, using a viral strain that had originally been isolated from a patient with pharyngoconjunctival fever. A total of 45 persons received intramuscular inoculations of either of the prepared vaccines. Of those inoculated, 78 per cent showed the development of Type 3 neutralizing antibodies, and no untoward reactions occurred. The volunteers were challenged with the Type 3 Adenovirus by swabbing the palpebral conjunctiva of one eye with the virus.

Observers in this study found that volunteers with vaccine-induced antibodies experienced greater protection against illness and infection than did

vaccinated or unvaccinated persons without demonstrable antibodies. The vaccine-induced protection apparently was equal to the unvaccinated volunteers' protection from naturally acquired antibodies.

The report of a field trial with a new Adenovirus vaccine was announced in 1956 by the Public Health Service and the Navy Department.^{3, 43} The study was performed on naval recruits at the Great Lakes Naval Training Center, utilizing a trivalent Adenovirus vaccine of Types 3, 4, and 7. A single 2 cc. injection of the formaldehyde-inactivated vaccine was given intramuscularly to 4,000 naval recruits at the base early in 1955. Although the findings were incomplete, the preliminary results did show that a neutralizing antibody response occurred to each of the three virus types in the vaccine, and that no untoward local or general reactions were manifest. The workers felt that 50 to 70 per cent of the total expected febrile respiratory illnesses were prevented by the vaccine. During the period of observation, illness due to Types 3 and 7 Adenovirus was not prevalent, but the Type 4 virus was encountered in a substantial proportion of these feverish respiratory illnesses. All evidence indicated that the vaccine induced a definite reduction in the rate of occurrence of illnesses associated with Adenovirus Type 4. It was postulated by the investigators that "vaccination of substantial numbers of arriving recruits might produce herd immunity sufficient to completely prevent outbreaks among recruits of respiratory illness due to the Adenoviruses, preventing the usual interference with military training routine."³

Discussion

As one considers the important role played by various respiratory infections in the total spectrum of human diseases, it is readily apparent that any progress in this field has valuable implications. The problem of the common cold, with its great economic and medical effects upon the human population, demonstrates the necessity for continuing research for the etiology, pathogenesis, and therapy of many of these infectious diseases of the respiratory tract. The discovery of the Adenovirus group, and the subsequent incrimination of these agents as the cause of certain respiratory illnesses of previously unknown etiology, portend future similar results of research for other agents which cause these infections. Thus, the stimulus supplied by research with Adenoviruses may yield better elucidation of the whole problem of respiratory infections in man.

Although the difficulty of terminology has been clarified to a large degree by recent agreement of interested workers to use the name Adenovirus group for the newly-discovered agents, the final word has

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not been stated in this matter. The ultimate name must be approved by the Subcommittee on Viruses of the International Nomenclature Committee, but the present name has served, at least, to eliminate the great confusion of terms previously seen in medical literature.

Isolation of more strains of the Adenoviruses undoubtedly will continue. Separation of these strains into specific types presents somewhat of a problem. The total number of these serological types is yet to be determined, using the classification of Huebner, since many strains do not fit into the presently-designated 14 specific types.

Most isolations of Adenoviruses have come from adenoid tissue or secretions of the respiratory tract and from the conjunctiva of the eye. However, in a few instances, viral agents of this group have been recovered from feces and other organs not associated with the respiratory tract.^{8, 13} Investigators found the viruses in a case of mesenteric lymphadenitis, in the stool of an infant with Roseola infantum, and from a case of Letterer-Siwe disease. This raises the possibility that certain of these agents may cause diseases of other organs, besides those of the respiratory tract. Further research in that direction seems indicated.

A problem relating to the common sites of infection by these viral agents has not been adequately solved. The presence of several antigenic Adenovirus types in tonsillar and adenoid tissue, without evidence of production of overt disease, raises the question of the effect of this silent infection if it proves to be of marked chronicity. Enders¹³ has speculated that the viruses may act like the Herpes virus, with the latent infective agent producing disease only under appropriate stimuli. Also, the relationship of long-standing silent infection to tonsillar and adenoid hypertrophy has not been explained completely.

Successful results presented in preliminary reports of a field trial with a new trivalent Adenovirus vaccine are encouraging for their promise of preventing respiratory illnesses caused by the Adenovirus group. This vaccine used only Types 3, 4, and 7, but it was apparently effective against these types. Undoubtedly, a vaccine could be produced that would combine all specific types of the group that have been shown to produce clinical disease. Utilization of such a vaccine would have great value in prevention of large-scale epidemics that have occurred in the military population and in some civilian groups. A major portion of future research with the Adenovirus group probably will be devoted to the preventive medicine aspect, through the method of active immunization.

Summary

The isolation of a new group of viruses from adenoid tissues was reported in 1953 by a group of investigators at the National Institutes of Health. Other research workers isolated additional viral strains that were later demonstrated to belong to this new group of agents.

Following a period of confusion in nomenclature, interested workers in this field agreed upon the present term "adenovirus group" for the collective name for these agents.

The Adenoviruses have been discovered to be etiologically related to several distinct clinical entities of previously-undetermined cause. Types 4 and 7 are associated with "acute respiratory disease" (ARD), while Type 8 has been isolated from a specific eye infection termed epidemic keratoconjunctivitis (EKC). Pharyngoconjunctival fever is apparently produced by infection with Adenovirus Type 3. Common clinical features present in illness produced by these viruses include fever, pharyngitis, cervical lymphadenopathy, and respiratory symptoms of cough and hoarseness. In addition, conjunctivitis is a prominent finding in many cases.

All agents in this group share a common complement-fixing antigen. Specific types are determined by use of the neutralization test. At present, 14 serologically distinct types have been classified.

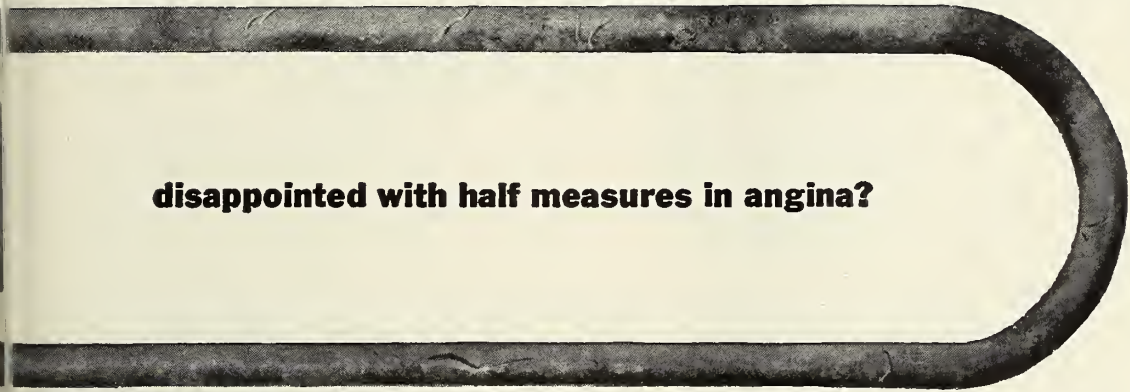
These agents have the ability to grow in various tissue cultures where they exhibit the characteristic of cytopathogenicity. Nuclear changes produced in tissue culture cells by members of the Adenovirus group are distinctive.

No specific treatment has been discovered to be effective. Prevention of respiratory infections caused by these agents, using a vaccine for active immunization against the viruses, may be the method for control of such diseases. Production of a trivalent vaccine, and recent testing of this vaccine in a field trial, have demonstrated the effectiveness of such a measure for developing an active immunity to the Adenoviruses.

Through the intensive efforts of several different groups of investigators, the solution to the problem of at least some of the many respiratory infections may eventually result.

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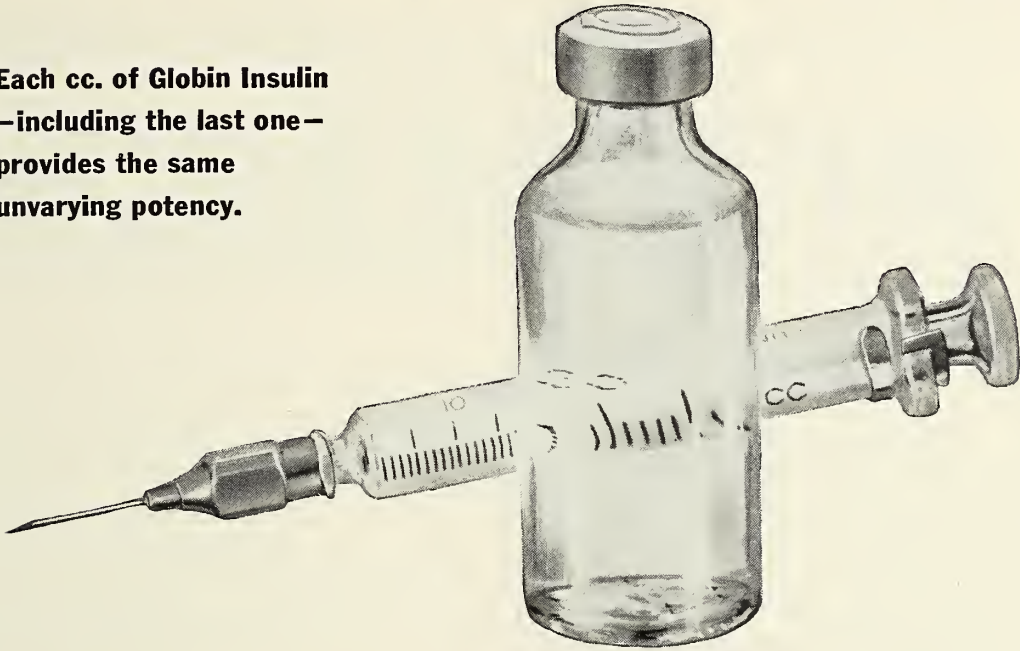
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Courses for Medical Assistants

An opportunity to attend educational courses sponsored by the Kansas Medical Assistants' Society will be offered to all medical assistants in the state on Saturday and Sunday, October 26 and 27. The organization stresses the fact that membership is not requisite for attendance at the course.

Programs will be presented at four centers, Parsons, Wichita, Hays, and Kansas City. Each will begin on Saturday evening with separate seminars for technicians, nurses, and office personnel. Three subjects will be discussed on Sunday morning: (1) contract medicine, insurance, and government programs; (2) the doctor's office from the point of view of a patient, and (3) panel discussions on vocational rehabilitation, social welfare, and social security freeze benefits. A luncheon and program will follow the morning session. Physicians and medical assistants will serve as moderators, and a number from outside the profession will participate.

A registration fee of \$10 will be charged each medical assistant who attends.

Acute Intermittent Porphyria

(Continued from Page 667)

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DEATH NOTICES

ALONZO PITT GEARHART, M.D.

Dr. A. P. Gearhart, 84, who had practiced in Wichita for 30 years before his retirement in 1951, died at his home in Oceanside, California, on August 18. He was an honorary member of the Sedgwick County Medical Society and a fellow of the American College of Surgeons. Dr. Gearhart was graduated from the University Medical College of Kansas City in 1898 and practiced first in Blackwell, Oklahoma, moving to Wichita in 1921.

HENRY BLACKBURN MILLER, M.D.

Dr. H. B. Miller, 76, Shawnee County physician since 1909, practicing principally in Rossville, died at a Topeka Hospital on September 8. For a short while in his youth he was a chemistry instructor at the University of Kansas, but he later studied at the University of Pennsylvania School of Medicine, graduating in 1908. The next year he joined his father in practice in Rossville.

CLARENCE AVERY PARKER, M.D.

Dr. C. A. Parker, 80, an honorary member of the Sedgwick County Medical Society, died at his home in Wichita on September 19 after an illness of four months. A graduate of the University of Nashville College of Medicine in 1903, Dr. Parker began practice in Maize, remaining there until he was called to serve in the medical corps during World War I. He had practiced in Wichita since 1922.

GEORGE ARTHUR WESTFALL, SR., M.D.

A member of the staff of the Hertzler Clinic, Halstead, for 27 years and a former chief of staff there, Dr. G. A. Westfall, 66, died at a Halstead hospital on September 18 after an extended illness. He was an honorary member of the Harvey County Medical Society. Dr. Westfall, a fellow of the American College of Physicians, was graduated from Tulane University School of Medicine in 1913 and began practice in Kansas in 1918. Two of his sons are physicians and one, Dr. G. A. Westfall, Jr., practices in Halstead.

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Increase in Hospital Usage

The ratio of hospital admissions to population in the continental United States outstepped the total population increase in the 11-year period 1946-1956, according to the annual report on hospital statistics published recently in the *Journal of the American Hospital Association*.

Admissions to hospitals of all types in 1956 were 22,089,719, or 132 per thousand population. In 1946 the rate was 112 per thousand population. Had the ratio of admissions to population remained constant at the 1946 level, there would have been only 19 million admissions in 1956, rather than the actual 22 million reported. Over the 11-year period, the number of admissions climbed 41 per cent, and from 1955 to 1956, nearly 5 per cent.

The hospital statistics released today were compiled from questionnaires sent to 6,966 hospitals listed by the American Hospital Association in its annual directory of hospitals. These statistics cover the years from 1946, when the Association began its statistical series, through 1956.

The 6,966 hospitals in the continental United States had 1,607,692 beds and an average daily census of 1,355,792 in 1956. Of these hospitals, 51 per cent were nonprofit, 17 per cent proprietary, 6 per cent federal and 26 per cent state and local governmental hospitals.

The voluntary nonprofit hospitals led in number of admissions—nearly 15 million in 1956. Over 4 million admissions were to state and local governmental hospitals. Proprietary and federal hospitals each accounted for about 1.5 million admissions.

Of the average 1,355,792 patients in hospitals on any given day in 1956, 62 per cent were in state and local governmental hospitals, 24 per cent in nonprofit hospitals, 12 per cent in federal hospitals, and 2 per cent in proprietary hospitals. The large percentage of patients in the governmental hospitals each day reflected a high proportion of psychiatric and tuberculosis institutions providing predominantly long-term care.

Although less than 2 per cent of all admissions were to psychiatric hospitals in 1956, 53 per cent of all patients in hospitals on any given day were in psychiatric institutions.

The number of hospital births reported in 1956 was 3,491,141, an increase of 64 per cent over 1946 but only 1 per cent above the 1955 figure. Nearly 72 per cent of the total hospital births in 1956 were in short-term nonprofit hospitals, while 18 per cent were in nonfederal governmental hospitals, almost 6 per cent in proprietary hospitals and 4.5 per cent in federal hospitals, the Association's statistics showed.

Total hospital assets, first reported in 1947, rose in 10 years from less than \$6 billion to more than \$13 billion for all hospitals, an overall jump of 122

per cent and a rise of 9 per cent from 1955 to 1956. At the same time, the total expenditure by hospitals for the care of patients passed the \$6 billion mark in 1956, an increase of 207 per cent in 11 years and nearly 8 per cent in the last year. Payroll expense for all hospitals was almost \$4 billion in 1956, an increase of 258 per cent in 11 years and a jump from 56 per cent of the total hospital expense in 1946 to 66 per cent in 1956, according to the Association.

Assets for the 3,165 nonprofit short-term hospitals in the continental United States totaled almost \$6 billion. These hospitals spent almost \$3 billion for patient care in 1956, a rise of 223 per cent from 1946 to 1956, and 9 per cent in the last year. Payroll expense was almost \$2 billion.

Length of stay in short-term general and special hospitals, which had dropped from 9.1 to 7.8 days from 1946 to 1955, went down .1 day to 7.7 days in 1956, with a decrease from 9.7 to 9.4 days in nonfederal governmental hospitals. Length of stay in nonprofit short-term hospitals was 7.5 days, and in proprietary hospitals 5.6 days, unchanged for both these types from 1955 to 1956, the Association reported.

Nonprofit short-term hospitals in 1956 spent \$24.99 per day to care for each patient, an increase of 149 per cent from the 1946 figure of \$10.04. The rise from the 1955 level of \$24.15 was a little over 3 per cent.

The cost to the nonprofit short-term hospitals for the average patient stay rose less than the hospital's cost per patient day during the 11-year period, because of the reduction in length of stay. From 1946 to 1956, the average cost to the hospital per patient stay rose from \$88.35 to \$187.43, an increase of 112 per cent as compared with the 149 per cent increase in the hospital's expense per patient day. Since length of stay remained unchanged from 1955 to 1956 in short-term nonprofit hospitals, the increase in cost both per day and per stay from 1955 to 1956 was about 3 per cent, the Association said.

Full-time personnel employed by all hospitals totaled 1,374,704 in 1956, an increase of 66 per cent in 11 years and nearly 6 per cent in the last year of the period.

In all hospitals in 1956, there were an average of 101 personnel per 100 patients, an increase of 28 people per 100 patients in 11 years. Short-term nonprofit hospitals had 213 personnel per 100 patients in 1956, while at the other extreme, nonfederal psychiatric hospitals had 31, the Association's statistical survey revealed.

Worry affects the circulation, the heart, the glands, the whole nervous system, and profoundly affects the health. I have never known a man who died from overwork, but many who died from doubt.—*Charles Mayo, M.D.*

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BOOK REVIEWS

Clinical Proctology. Second Edition. By J. Peerman Nesselrod, M.D. Published by W. B. Saunders Company, Philadelphia. 296 pages, 72 figures. Price \$7.00.

Dr. Nesselrod's concise style is again noted in this second edition of his very popular work. The basic material is briefly and practically presented. The chapter on anal infection clarifies the etiology of most common anorectal pathologies and rationalizes their treatment. Anal infection is further elaborated upon in each subject-chapter in which it is pertinent. Examination, pre- and post-operative management, therapy, and operative methods are those of the author.

Other chapters include anorectal malformation; clinical proctoscopy; neoplastic diseases, and miscellaneous subjects—all are brief but adequate. This is not an encyclopedic work but a clear, concise work which is easily read and understood. Dr. Nesselrod gives the reader the method he has found most satisfactory after years of experience as a clinician and teacher of proctology in a large medical center. The book is recommended for every physician as a ready source of knowledge in an area subject to frequent organic changes.—*L.A.S.*

Orthopedic Surgery in the Mediterranean Theatre of Operations. Part of Official History of Medical Department of U. S. Army in World War II. Edited by Col. John Boyd Coates, MC; Mather Cleveland, M.D., and Elizabeth M. McFeiridge, M.A., Office of Surgeon General. 368 pages. Price \$4.00.

This is a history of the development and employment of military orthopedic surgery in World War II. It is one of a series of volumes published under the auspices of the Medical Department of the United States Army. The book is not large (340 pages), but it contains numerous photographs and illustrations that illuminate each major point. The following examples will illustrate best the scope of the book.

The events and decisions that led inevitably to final definition of treatment principles to be applied in handling the wounded soldier are reviewed from the over-all medical standpoint. The medical plan as it finally evolved was not assembly line medicine with a physician at each medical station performing one assembly line performance in the chain of evacuation, but more aptly might be compared to a conveyer belt from the Battalion Aid Station to the general hospital. The conveyer belt progress could be interrupted at any point and the wounded soldier held for definitive treatment or, if recovered, he could be returned to combat.

Initial surgery was of necessity in the Combat

Zone, reparative surgery in the Communications Zone, and reconstructive surgery in the Zone of the Interior. The tale of the development of this plan by blood, discouragement, and experience will be especially interesting for those officers who served through the Mediterranean campaign.

It is worth pausing to recall the impact penicillin had on the morbidity and mortality of the wounded. Penicillin was a major factor in permitting the change in compound fracture treatment from the ritualistic Carrel-Dakin treatment of World War I of cleanse, debride, irrigate, drain, and immobilize to the World War II policy of cleanse, debride, close, and mobilize. This medical advance resulted in the preservation of the military usefulness of thousands of soldiers.

The evolution and function of the highly efficient medical consultant system is also described in detail. Now that a lapse of years permits a more objective analysis of the whole medical personnel structure with their varied training and capacities, it may be seen that the medical consultant system was a most essential step. The consultant was the medical liaison officer who disseminated by personal visits new techniques, corrected faulty procedures, and welded the Medical Corps into one cohesive unit.

To Oscar Hampton, the author, medicine owes a sincere vote of thanks for his excellent treatment of a difficult subject and the preservation of the story of the anguished development of military orthopedic medicine in World War II.—*H.O.M.*

Modern Therapy in Neurology. Edited by Francis M. Forster, M.D. Published by C. V. Mosby Company, St. Louis, Missouri. 792 pages. Price \$12.00.

For too long now the field of neurology has been represented as one of diagnostic and research potential alone. Too little stress in the training of the young neurologist has been placed upon his *role in the treatment* of illness affecting the nervous system. It is, therefore, refreshing and encouraging to have available this treatise on modern therapy in neurology.

Experienced and respected neurologists have collaborated to present in readable fashion the traditional method of treatment of familiar neurologic disorders. It might be said that too many pages are devoted to diseases and treatment situations in which neurologists at large possess no special talents either by training or experience; or that some chapters more suggest sifting of recent literature than opinions of experienced therapists.

But this book is obviously not a manual of helpful hints or special tricks in treatment of specific neurologic patients; it is rather a talented display of the broad scope of usefulness of the trained neurologist in the treatment of illness, and in this light it is a magnificent success.—*J.A.S.*

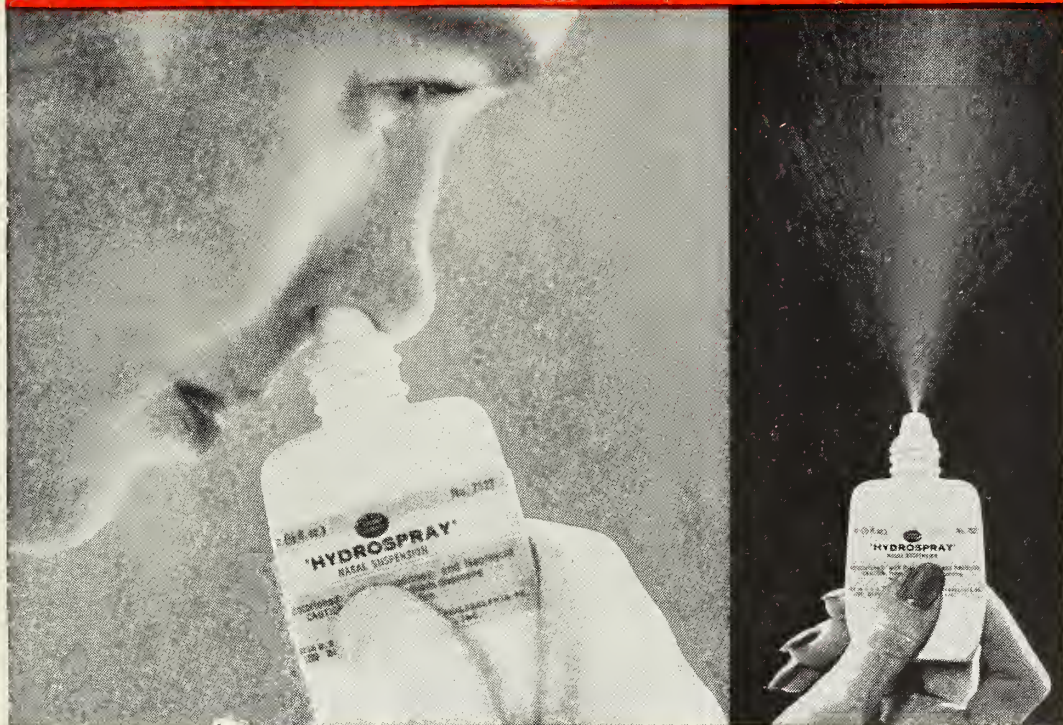
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REFERENCE: 1. Silcox, L. E., A.M.A. Arch. Otolaryng. 60:431, Oct. 1954.

Psychosomatic Medicine: A Clinical Study of Psychophysiologic Reactions. Third Edition. By Edward Weiss, M.D., and O. Spurgeon English, M.D. Published by W. B. Saunders Company, Philadelphia. 557 pages. Price \$10.50.

This useful and important book has undergone extensive revision of material and a general reorganization which is most welcome inasmuch as a great mass of data has accumulated since the publication of the second edition in 1949. The senior author's background and original training in pathology have proved to be almost invaluable in enabling him to sort out important contributions and present them in such an objective manner. This has resulted in a work that is practical, concise, and easily readable, and it still contains sufficient theoretical background material to support important data.

This book is ideally suited for the use of the clinician. It contains very little material that could not properly be incorporated into a volume on internal medicine, but until such time as there is better integration between the emotional and somatic considerations of disease, the clinician could well consider this book a supplement to his books on internal medicine and physiology.

The book is organized in two parts. The first part consists of 176 pages devoted to the general aspects of psychosomatic medicine. The chapters on "Personality Development and Psychopathology" and "Everyday Problems of Psychotherapy" are well worth the time of any clinician. The second portion of the book, "Special Applications to General Medicine and the Specialties," consisting of 347 pages, is an excellent discussion particularly applicable to those clinical problems in which illness is partly dependent on emotional factors and those cases in which the vegetative nervous system is definitely involved in the production of the disease and secondary pathological changes.

Although the authors do not state it in so many words, it is obvious that it is their feeling that in many cases it is desirable that the clinician not only have a thorough understanding of the underlying psychological factors, but also that he can find a great deal to do in the area of psychotherapy. This book is evidently an attempt to help the clinician have a better understanding of these underlying factors, a better understanding of his important role in psychotherapy, to give him reassurance in making that all-important decision as to whether he is capable of going ahead with the patient or whether specialized psychiatric help should be sought. Very little space is devoted to the strictly psychiatric problem that is best cared for by the psychiatrist. This is in no sense a textbook of psychiatry, but one that could well have its place in any general medical library.—*T.L.F.*

The Treatment of Burns. By Curtis P. Artz, M.D., and Eric Reiss, M.D. Published by W. B. Saunders Company, Philadelphia. 250 pages, 199 illustrations on 105 figures. Price \$7.50.

This is a practical handbook for the doctor dealing with burned patients. Emphasis is placed on the multiplicity of pathologic changes in the severely burned patient, as well as on rational treatment. From accumulated information from the literature, and from careful observations in the treatment of more than 1,000 burned patients over a period of seven years at the Brooke Army Medical Center, the authors present an integrated regimen for treatment. The magnitude of the burn problem, both civilian and military, and the general need for more expert treatment on the part of the practitioner are stressed.

General immediate care depends on: (1) estimation of percentage of body surface burned; (2) estimation of depth of burn; (3) evaluation of site of burn; (4) evaluation of age and physical condition of the patient. From the above observations, patients are classed into critical, moderate, and minor cases.

The critical cases include: (1) burns with injury to the respiratory tract; (2) partial thickness burns of more than 30 per cent of the body surface; (3) full thickness burns of face, hands, feet, genitalia, or more than 10 per cent of the body surface; (4) burns complicated by fractures or soft tissue injuries; (5) electrical burns; (6) deep acid burns.

These patients should be sent to a well equipped general hospital and placed under the care of experienced clinicians.

Moderate burns include: (1) partial thickness burns 15 to 30 per cent of the body surface; (2) full thickness burns of less than 10 per cent of body surface provided face, hands, feet, or genitalia are not involved. These patients may be treated in the community hospital.

Minor burns include: (1) partial thickness burns involving less than 15 per cent of the body surface, and (2) deep burns involving less than 2 per cent body surface. These may be treated as out-patients and hospitalized for skin grafts, when necessary.

Aside from the obvious immediate care for the patient, the following outline of immediate organized procedures is suggested: (1) history—overall estimate of burn, weight of patient; (2) determine need for tracheotomy; (3) reassure patient, give intravenous morphine; (4) draw blood for laboratory determinations and start fluids; (5) if necessary, insert cut-down canula; (6) insert indwelling catheter into bladder; (7) plan fluid therapy; (8) give antibiotics; (9) give tetanus antitoxin or toxoid; (10) give local care; (11) make work sheet-type chart.

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loss of liquid, mineral, and protein elements. The Brooke modification of the Evans formula for fluid replacement is presented. Provision for individualization of the patient should be made. Local care of burned areas is somewhat dependent on location, extent, and degree of the burn. Generally the aim is to secure earliest coverage with minimal complications. Relative merits of occlusive and exposure treatment are discussed.

General and specific problems of reconstruction are mentioned. Early removal of eschar of the face is rarely indicated. A tracheotomy should be done on severe burns of the face. Eyelids should be grafted early if there is danger from corneal ulceration. Hands and other joint surfaces should be covered early. The penis should be grafted early, whereas the perineum may be allowed to granulate pending coverage of other areas.

Under "Metabolic Response and Nutrition," nitrogen balance, fat loss, fluid and mineral changes, endocrine variations, and vitamin needs are discussed. Detailed management includes: (1) dietary—caloric needs, specific nutritional requirements, and (2) non-dietary—treatment of anemia, multiple transfusions, psychiatric care.

The problem of the debilitated patient is brought to attention. Important laboratory procedures are emphasized.

Practical details of burn therapy include problems of anesthesia, emotional disturbances in the patient, detailed nursing care, and rehabilitation.

In *The Treatment of Burns*, the authors have brought this subject up to date, culling pearls from a vast accumulation of literature and personal experience without being pedantic.—A.E.H.

The Specialties in General Practice. Second Edition. By Russell L. Cecil and Howard F. Conn. Published by W. B. Saunders Company, Philadelphia. 780 pages, 76 figures. Price \$16.00.

As a textbook for medical students or as a review and reference book for the physician a long time in practice, this book fills a great need. The 15 contributors have carefully selected and chosen the most important and frequently encountered maladies seen in general practice. Then they have carefully presented the least controversial methods of treatment.

Dr. Conn, himself a general practitioner and editor of the *Current Therapy* book so frequently seen on the bookshelf of the general practitioner, has drawn from his experience resulting from both endeavors to produce a ready handbook for the busy practitioner.

The illustrations are plentiful and well selected so

that many sketches and photographs are diagnostic and explanatory.

This second edition of a very popular book first published in 1951 has brought the general practice aspects of the contents up to date. All the newer antibiotics, tests, tranquilizers, and psychiatric attitudes have been included.

Like many books of medicine previously edited by Dr. Cecil, this book will be of real service in the physician's library. It should also serve as a guide in the general curriculum planning of a medical school wherein stress is applied to general practice teaching.—C.M.B.

Textbook of Pathology. By Stanley L. Robbins, M.D. Published by W. B. Saunders Company, Philadelphia. 1,351 pages, 933 figures. Price \$18.00.

The major part of this book was written by the author with collaborators on only five chapters. The author states that the book is written for students and clinicians and that, among other goals, he has attempted to avoid distracting detail. The detail which may be distracting to the beginning student, however, will be missed by the individual with some knowledge of pathology who wishes additional information. It seems probable that this book will serve its greatest usefulness to the medical student rather than to the clinician. It contains a substantial amount of well presented information, although there are small errors which are difficult to avoid when one author attempts to encompass in his writings a large part of the total field of pathology.

Although the author has placed a considerable emphasis on relating pathology to clinical medicine, this relationship has not been made as clear in some places as might be desired. By intent, the author has selected fewer references than usual and employs them as collateral reading and not as documentary evidence of statements. The parenthetical remarks after references, which serve to assist the potential reader in knowing what he may expect, are certainly helpful. Some physicians, however, will miss the opportunity to be directed to specific articles elaborating on many of the points made in the textbook. In the opinion of this reviewer then, this textbook will not serve many as a ready introduction to the original literature in pathology.

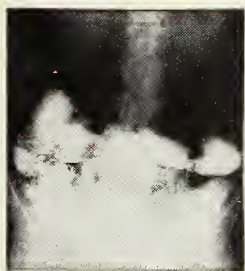
The style of the author's writing is of satisfactory readability and ease of understanding. The use of bold face and italic type is of assistance in emphasizing certain important points. The outlines given at the first of each chapter are helpful in guiding one to the areas of interest within the chapter, some of which are of substantial length and would otherwise

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be quite confusing. Although the printing is generally of excellent caliber, in some copies the bold face type does not stand out distinctly black. The illustrations are generally of outstanding caliber and ample in number.

This textbook should play a useful role by serving as a reasonably thorough introduction to the subject of pathology, being intermediate in length between some of the brief synopses and longer, more detailed books on pathology.—R.E.S.

William Harvey: His Life and Times: His Discoveries: His Methods. By Louis Chauvois. Published by Philosophical Library, New York, 263 pages. Price \$7.50.

Dr. Chauvois has already been honored several times for his literary work devoted to the history of science and medicine. This volume should add to his laurels. Translated from its original French in the year of its publication, it belongs in the library of every physician who has an interest in the long and rich history of our profession.

The author writes with an authority based on extensive research into the professional and personal life of Harvey, and although one can assume certain details of description to have their origin in the author's imagination, this literary license only serves to make the reading more enjoyable.

Perhaps the outstanding features of this work are the clearly-drawn details of background surrounding the portrait of the man himself. The reader clearly sees Harvey wrestling with the prejudices of his time in civic, political and scientific matters, and always discarding any idea or doctrine which seemed to be based solely on tradition or superstition. His practical approach was instrumental in saving four women who had been condemned as witches.

One also sees Harvey, the skeptical student, Harvey the scientist and physician, and finally Harvey in his last years of retirement, sage and senior citizen whose words and opinions were widely known and revered.

The work is sprinkled liberally with direct quotations and footnotes, the Harvey portraits are reproduced and discussed, and a bibliography of source material is given.—M.S.A.

Second Tissue Homotransplantation Conference. *Annals of New York Academy of Sciences.* Otto v. St. Whitelock, Editor-in-Chief. Volume 64, Article 5, Pages 735-1,073.

This issue contains a compilation of reports of various investigators in the field of homotransplantation of tissues. Emphasis is placed on the use of embryonic, fetal, and neonatal donor tissues. Reports

deal chiefly with efforts to beneficially influence the normal host-graft relationship. These progressively pooled efforts and their most fascinating reports, if carried to ultimate success, may eventually open the doors to boundless stores of human "spare parts." —A.E.H.

Mental Health Association to Meet

The annual meeting of the Kansas Association for Mental Health will be held in Topeka, October 25 and 26, with headquarters and registration at the Hotel Jayhawk. Three inspirational speakers, five workshops, and tours of the Topeka State Hospital and the Kansas Treatment Center for Children will highlight the program.

Standing committees will meet during the morning of October 25, and the Riley County Association for Mental Health will conduct film previews. Dr. George Jackson, director of institutions for Kansas, will speak at the luncheon session on Friday, and Senator Frank Carlson will give an address at the luncheon meeting on Saturday. Speaker at the Friday evening dinner will be Dr. Seward Hiltner, professor of pastoral theology at the University of Chicago Theological Seminary.

The five workshops will cover chapter organization, educational programs, volunteer services, finances and fund campaigns, and public relations.

Programs and registration blanks may be secured from the association, 324 New England Building, Topeka.

To Study Research and Education

Secretary Folsom of the Department of Health, Education, and Welfare has named a special committee of medical leaders and industrialists to advise him on the "status and future needs" of medical research and education. He asked the members to study such questions as:

1. Impact of expanding research programs on medical education.
2. Availability of scientists, technicians, and facilities.
3. Relative emphasis given to research in the various disease fields.
4. Relative emphasis given to fundamental studies in the basic sciences generally.
5. Relationship between federal and private research programs.
6. Standards for approval of research projects.

The Office of Education reports that for the first time since 1910 the percentage of high school students taking mathematics and science courses is on the increase.



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A.M.A. Plans December Session

Philadelphia will be the scene of the American Medical Association's 11th clinical meeting, December 3-6. Center of activities will be Convention Hall where scientific exhibits, color television, motion pictures, technical exhibits and scientific lectures will be presented. Headquarters for the House of Delegates will be the Bellevue-Stratford Hotel.

Highlights of the three-and-a-half day convention geared especially for the nation's family doctors include: (1) special transatlantic conference between distinguished physicians in London and Philadelphia on "Advances in Chemotherapy of Cancer" via two-way telephone at 3:00 p.m. EST Wednesday; (2) complete color television schedule of surgical demonstrations emanating from Lankenau Hospital; (3) motion picture program daily plus a special session Tuesday evening; (4) exhibits featuring a well-rounded program and special displays on the history of medicine in the Philadelphia area, fractures, and manikin demonstrations on problems of delivery; (5) panel discussions on cardiovascular disease, cancer, emotional problems of menopause, hypertension, diabetes, arthritis, traumatic injuries; (6) presentation of the General Practitioner of the Year Award to an outstanding family doctor.

Grant to University of Kansas

The University of Kansas School of Medicine, Kansas City, was recently awarded a grant of \$104,170 by the National Foundation for Infantile Paralysis for a study on what happens when different strains of polio virus invade the body of an experimental animal. The amount was part of a total of \$4,527,064 awarded to 61 institutions.

The over-all goal is to support:

1. Research to solve problems of polio and other viruses, to improve methods of polio vaccination and to develop drugs helpful in treatment of polio and other virus diseases.
2. Research into treatment of polio after-effects, including the development of an iron lung controllable by the patient.
3. Regional polio respiratory and rehabilitation centers—where dynamic methods of treatment are developed.
4. A professional education program aimed at relieving shortages of workers in health fields and raising the quality of care for polio and other patients.

Scan the road, check the rear
Look to left and right.
You may not pull a bonehead play
But the other fellow might.

Jenkins-Keogh Hearings

Hearings on the Jenkins-Keogh plan, and on the general subject of taxation, will be held in Washington beginning on January 7, according to an announcement by Representative Jere Cooper, chairman of the House Ways and Means Committee. The group refused to consider Jenkins-Keogh bills in the session just ended.

The Jenkins-Keogh plan, strongly supported by the A.M.A., would allow self-employed persons to set aside a portion of their income in pension plans and defer payment of income tax on it until it is received back in the form of pensions. Corporations now may do this for their employees. The American Thrift Assembly, headquartered in Washington, has carried on the fight for the legislation this year.

A.M.E.F. Fall Campaign

The American Medical Education Foundation will launch an intensive fall campaign for contributions to the nation's medical schools. October and November have been selected as the months in which to appeal to physicians for individual donations.

To assist local committees the A.M.E.F. has prepared a new pocket portfolio with information cards and pledge envelopes. A new folder entitled "So They May Serve" has also been produced for use in local and state mailings. A new exhibit, first displayed at the A.M.A. convention in New York, is available from the foundation office. Featuring pictures of medical schools and gift checks to A.M.E.F., this exhibit illustrates reasons why medical schools should be privately supported.

In a progress report as of July 1, the foundation announced that the six million dollar mark of contributions from the medical profession had been passed earlier this year. The report also stated that so far in 1957 the A.M.E.F. income is 15 per cent higher than in the same period last year.

Physicians are urged to contribute generously to the foundation during the remaining months of 1957.

A.M.A. Prepares Liability Kits

The American Medical Association's Law Department is making available to each state medical society a packet of materials dealing with "medical professional liability." The kit will contain reprints from the *Journal of the A.M.A.* "Medicine and the Law" section dealing with such things as statutes of limitation, court decisions, and "res ipsa loquitur." Also enclosed will be the results of an opinion survey and a report on medical professional liability case histories—keyed to each state. Distribution began October 1.

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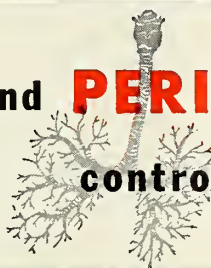
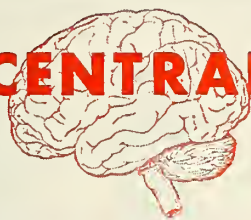
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To Publish Medicolegal Material

To guide physicians and hospitals in the selection of appropriate medicolegal forms, the A.M.A.'s Law Department has compiled a series of six brief articles for the *Journal of the A.M.A.* These articles will appear weekly in the *Journal*, beginning about September 1. In addition, the law department will publish a booklet encompassing the material plus case citations and legal analysis for distribution about October 1.

Chief purpose of this material will be to provide up-to-date information and miscellaneous medico-legal forms which physicians and their attorneys may adapt for their own needs. Subjects to be covered: (1) consent to operations and other medical procedures; (2) patient's right to privacy; (3) confidential communications and records; (4) artificial insemination; (5) the physician-patient relationship; (6) autopsy.

In all cases, the law department strongly advises doctors to seek competent legal advice locally.

Cytologic Test Advocated

A nationwide program emphasizing an annual cytologic test for uterine cancer for all women is urged by Dr. Charles S. Cameron, former medical and scientific director of the American Cancer Society, as a means of reducing the cancer mortality rate.

"Foremost medical opinion is convinced that if every woman in the country had this examination every year, the number of deaths from uterine cervical cancer would be cut by as much as 90 per cent," Dr. Cameron writes in a 25-cent pamphlet, *Cell Examination—New Hope in Cancer*, published by the Public Affairs Committee, 22 East 38th Street, New York City.

"This would mean an annual saving of 16,000 lives," Dr. David A. Wood, president of the American Cancer Society, 1956-57, declares in the introduction to the pamphlet.

"To make any real dent in mortality figures," Dr. Cameron points out, "a campaign will have to be launched on a national scale that will be carried forward on several fronts at once.

"Hand in hand with a public education program to alert American women to the new lease on life this procedure affords . . . must go the enlargement of facilities for carrying out cell examination for uterine cancer. More cancer preventive and diagnostic centers must be established for persons who are apparently well.

"The cooperation of two kinds of physicians is

needed for cyto-diagnosis," Dr. Cameron adds, "the pathologist who specializes in analyzing body tissue and fluids and all doctors who in any phase of their practice give female examination. . . . The role of the family doctor is equally important. He bridges the gap between the public and the pathologist.

"The biggest hurdle of all is facilities for screening slides. More pathologists will have to specialize in cytology, more cyto-technologists must be recruited, and more laboratories must be established to take care of the increased demand.

"The American Cancer Society and the National Cancer Institute are joining hands with pathologists and doctors to help enlarge cytologic facilities. They have both given grants to the National Committee for Careers in Medical Technology for the production and utilization of a recruitment film to induce more young people to enter the career of cyto-technologist."

Meanwhile, "women need not wait hopelessly until science discovers a cure for cancer. They can insure themselves against the scourge of at least one of the major types of cancer now by insisting on a cytologic examination for uterine cancer each year after they are 35," Dr. Cameron concludes.

"Every individual literally holds his own life in his hands as he makes the decision whether or not to bother about examinations. . . . When they accept it as a routine step in medical care, not only will a great victory have been won over one form of cancer but early detection of other kinds will have been made easier."

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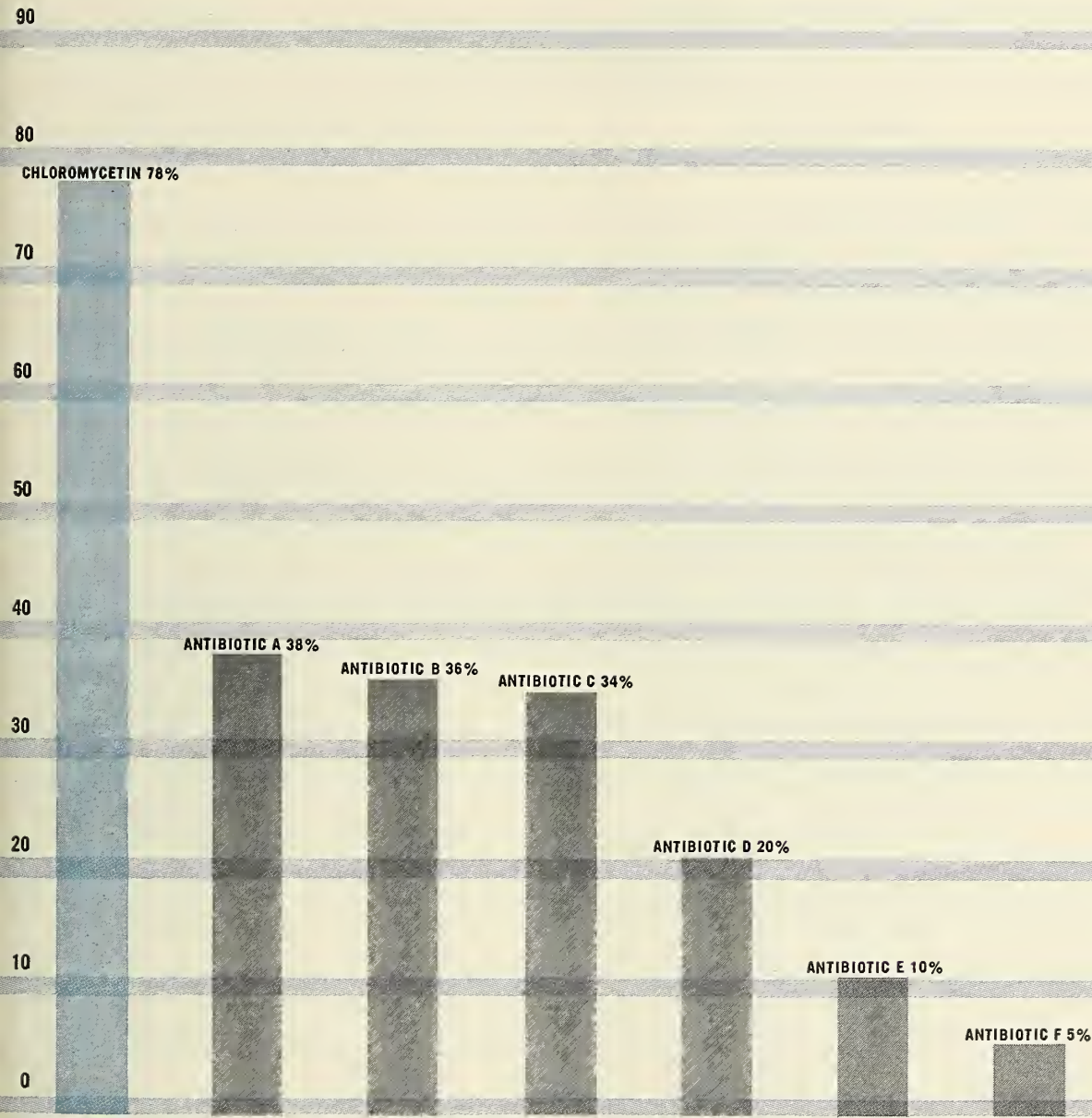
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THE JOURNAL

of the

KANSAS MEDICAL SOCIETY

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Volume LVIII

NOVEMBER, 1957

No. 11

As the Twig Is Bent

J. H. MEANS, M.D., *Boston*

When Professor Dimond invited me to give your third Ralph H. Major lecture, I felt highly honored because I admire Dr. Major for his significant contributions to medical scholarship. When, however, I studied the specifications for this utterance, I became aware that here was a challenge not only impelling but difficult to meet.

Dr. Dimond wrote me that what is wanted is something of my own choosing, but definitely something not scientific. It could be about the history of medicine or about my favorite hobby. The less scientific and the more philosophical, the better.

This is indeed a somewhat unique directive, and more than I can satisfy in full. It would, for instance, be presumptuous for me to enter the realm of medical history here in the home of a master in that field. Also, contrariwise, no more can I altogether avoid the scientific. We live in an age, whether we like it or not, in which science is overwhelming. Neither you nor I can escape science, and in this lecture I shall have to talk of it, but at least my approach to science will be philosophical.

I am thinking of philosophy in the sense cited by Bertrand Russell, namely that "an essential part of its purpose" is "to tell men how to live." As to hobbies, they will come in of course as being essential to the well integrated life, at least provided they are recreative and not merely diverting. One of my teachers, Dr. Richard C. Cabot, said what men live by are work, play, love, and worship, and I have found these a dependable guide to the good life.

The proper title for this talk caused me some concern also. Titles are very important. They likewise are tricky. If the title of a book is not appealing, people may not read it, and if that of a lecture is

in no way alluring, people may not attend it. One must, of course, beware of plagiarizing, even though Tom Lehrer recommends it. There are such excellent titles to be found for what we want to say, but someone else has used them: "The Life and Opinions of Tristram Shandy-Gent," for example, or "Out of My Life and Thought." Either of these would suit my purpose very well, but they are not available.

What I actually want to tell you of tonight are the effects which certain persons, ideas, and events have had upon the course which I have followed through my professional life. I hope the title which I have finally chosen will convey this meaning. In any event I will say this—ye who write, give prayerful consideration to your titles. If poorly chosen you may not be read. In scientific writing, if your title doesn't lead to adequate indexing, you may not even be found. I am under no such restriction tonight because this lecture is not scientific, but to avoid any sin, I will tell you my title is taken from "The Moral Essays" of Alexander Pope.

For many years I have been deeply interested both in medical research and medical education. I have followed the course of development of young people going into medicine with keen interest and have watched them grow. At many points I have been in contact with their progress.

Out of such experience has sprung great curiosity about why actually people do go into medicine. There are undoubtedly many reasons. I might attempt a classification of these, but that would be too "scientific" perhaps. Instead I will trace for you, as well as I can discern it, why I went into medicine myself. I hope you will treat this revelation in the same spirit you would any other case history for what, if anything, it is worth, but no more.

The seeds of our life interests may be planted in

childhood. When this is so it may be fortunate. At least it can be said, "Happy is he who knows what he wants to do, when what he wants to do is something he is capable of doing competently." It is always depressing to me when a premedical student gives as his reason for going into medicine that he cannot think of anything better. Although such a one may become inspired during his medical school days, I would offer higher betting odds on one in whom the fire had been kindled earlier.

The first great intellectual stimulus that I can remember receiving came, not from school, but from my father. A man of brilliant mind, he should by all rights have had the opportunity to become a career scientist. Being an impecunious parson's son, however, he felt impelled to go into business and make his living. This he did with such success that by 40 he was able to retire and devote the rest of his life to scientific work in the field of aeronautics. Doubtless he would have gone farther if he had had a scientific education, but with only self-education, he made pioneer studies of recognized importance. Among other things, he published in the 1890s the first journal in the United States devoted to aeronautical science—*The Aeronautical Annual*.

I have on my desk at home a letter from Orville Wright to my father dated January 15, 1908, in which appeared the following words: "The old annuals were largely responsible for the active interest which led us (the Wright brothers) to begin experiments in aeronautics."

My father's own experiments had to do with the shape of airfoils. He released gliding models from kites and observed the relation of wing form to length of glide. This was in the late 90s. He predicted in one of his *Annuals* that man would fly as soon as he developed a light motor. The use of gasoline accomplished that.

I was raised in this atmosphere of inquiry, and my father took pains to encourage any budding scientific interest that he thought he found in me. He made no attempt, however, to force me into his own field. Natural history seemed more my dish, and he got me good books in that area. By far the most significant of these were two, the first on invertebrates, the second on vertebrates, by an English lady, Arabella Buckley, who was, or had been, secretary to Thomas Henry Huxley. Very gently this writer led her child reader to the concept of evolution and the Darwinian theory. This was when I was nine or ten years old. I found it very exciting, so much so that at 14 I plunged into the *Origin of Species* and read it through with rapt attention from cover to cover. Recently, full of vainglory, I told about this accomplishment to the great mathematician, Norbert

Wiener, whom I have met at MIT, where I now work in the health department. His deflating reply was, "I read it at six!"

Three years following the reading of the *Origin* came a wonderfully stimulating year as a special student at MIT under Professor William T. Sedgwick, head of the biology department. This too I owe to my father. Sedgwick was his friend, and he steered me into his hands.

Sedgwick was a great teacher and pioneer in his field. He taught biology as the integrated science of life—all life. It was a refreshing advance beyond the old descriptive and taxonomic zoology and botany. Here I first observed living bacteria under the microscope, including the typhoid bacillus with its cilia. Also there was a bit of embryology. The concept that ontogeny is the repetition of phylogeny emerged, and as a piece of weighty evidence in favor of evolution, I found it thrilling.

Sedgwick, together with Edmund B. Wilson, was author of a textbook which itself was to me one of the great books. Its title was *An Introduction to General Biology*. I have the copy in my bookcase today. The point about it is that it embraced biology as a single subject at a time when most universities and colleges in the United States had separate departments of zoology and botany, each with their own textbooks. Many still do today. It was a forward looking book.

The Tech year was a strange interlude. It was not a sort of thing included in those days (or maybe in these), in any orthodox American educational program. But for me it was truly fateful. At this stage I determined to become a career biologist, and although soon after I shifted to medicine, a strong interest in its biological aspects has remained with me for life. It was somewhere at the interface of Tech and Harvard College, to which I went next for four years, that the shift from basic biology to the applied biology of medicine came about, but how or why it occurred, I can no longer recall. In any event it was no radical turning, for although medicine is far more than applied biology, yet applied biology is certainly a part of it. Today, however, medicine stems also from biochemistry, physics, psychology, and sociology. Indeed medicine can be said to be not a science in its own right, but rather a professional calling, or discipline, with definite and specific objectives, to reach which it will draw from the knowledge to be found in any of the basic sciences or arts which proves useful in meeting them.

Through practice also medicine acquires a vast stock of experience of its own, of how to deal with human beings in matters related to their health. I believe that the thought of practice was a factor in

swinging me from basic biology to medicine, but I cannot be sure. Perhaps if I had ever had that deep Freudian analysis I would know. But I never did have it, and that is something I regret somewhat. One may justifiably at this juncture ask why does anyone go into medicine, but there isn't time this evening to go into all that. I have told you that I don't quite know why I did. Nevertheless I did and have never regretted it.

Having chosen such a profession as medicine, however, the problem next becomes how to prepare for it. In the last half century or so in the United States this has been done in the liberal arts college (a uniquely American institution), and to a minor degree in the undergraduate courses of the great engineering schools. MIT, for example, sends 15 to 20 students to medical schools each year and has done so for a long time. The objective in college is twofold—to prepare for the professional education which is to follow, and to pick up a modicum of general education more advanced and of higher quality than that provided by the secondary school system.

I tried to do just this in Harvard College in the first decade of the century. In those days there was a totally free elective system. Only one or two courses were prescribed. C. W. Eliot, who was then president, believed in offering a magnificent array of courses and then letting each student choose what he liked. If the student saw fit to select a foolish assortment, that was his business, not the college's. To get a bachelor's degree one had merely to pass 17½ courses with an average of C. Many went to college in those days, if they could afford it, because it was the fashionable thing to do, rather than in the genuine pursuit of learning.

I can truthfully say that I took the college educational opportunity seriously myself. From the present vantage point I can see certain mistakes that I made, and on the basis of them I can give some warnings. In the first place, I overdid the strictly premedical part of the program, taking some subjects repeated in the medical school. I have also long regretted that I had not more mathematics and modern languages. On the basis of my own experience, and from what I learned from students from a variety of universities, liberal arts colleges, and engineering schools, whom I have interviewed for medical school, I would recommend that the premedical student take the minimum of premedical requirements but try to make excellent records in these. Then he should really see to it that his general education doesn't suffer. It should be recalled that a certain amount of basic science is today a legitimate part of general education, but this must be balanced by an adequate exposure to the humanities.

In my case, in Harvard College I had a lovely time in philosophy under some truly great scholars, and to some degree in history, sociology, and economics, but I have the feeling now that under the completely free elective system of those days I chose what I found delightful and easy and sidestepped some of the subjects which for me were more rugged. I fancy that nowadays with more directed undergraduate curricula, such scholastic evasions may be less easy.

The premedical student of today is to some degree in a difficult position, far more so than in my youth. He may greatly desire to become a well educated person in college, but he also wants to become a doctor, and to do the latter he must gain admission to a medical school. If then, to get into medical school, which we must admit is a highly competitive business, he feels that he has to get the highest possible marks in prescribed premedical studies, he gives his major effort to these. Often this will be to the detriment of his general education. A real dilemma!

I have dreamed up a program which I think might solve this problem, but so far I have not succeeded in getting anyone to try it out. It would be, briefly, for a faculty of arts and sciences to cooperate with the preclinical departments of a medical school, to offer to students a combined general and professional educational course which would run along uninterruptedly for five or six years, at the end of which time they would be qualified to enter the third year class of a medical school. There would be no difficulty in getting into medical school at that level after such an education. It is essentially what is done in Britain and on the continent of Europe. I would like to see it attempted here.

In medical school in my day, as also today, the student is exclusively on the medical beam. He has no time, and unfortunately, perhaps but little mind, for anything else. To those who love it, medicine, both in its basic (preclinical) areas and at the bedside, is all absorbing. The student who doesn't find it so, even at this late date, had better drop it and go into another calling. If he continues in medicine it will be for what he thinks it offers him in the way of material gain, and that motivation is not what is needed in medicine.

The love of any subject often is triggered off by certain teachers who set students aflame. In my medical school days I was greatly stimulated by Walter B. Cannon, professor of physiology, who first disclosed by means of x-rays the peristaltic activity of the alimentary tract and the effect of the emotions on somatic functions; also by Lawrence J. Henderson, who taught us about the reversible chemical reactions whereby the neutrality of the blood is preserved and

the respiratory gases are transported. Thus was pre-saged in our minds the psychosomatic medicine of today and the necessity of safeguarding therapeutically the integrity of the electrolyte balances of body fluids. Theory based on accurate observation should lead the way to sound practice. Scientific medicine—yes, but basic, not medical, science.

At this point I would like to inject some remarks on the medical curriculum. A curriculum, of course, is but a means to an end, but even so it is of some importance. I have been interested in the medical curriculum ever since student days. In my fourth year, along with some other troublemakers, I drew up a critique of the whole four-year program which we had just been through and submitted it to the faculty. It was courteously accepted and probably filed in the wastebasket, but it did us some good to write it. Since then, through the years, I have continued to be interested in curriculum reform. Twice I have served on committees which made extensive studies and submitted reports, which resulted in the taking of certain steps—inadequate, but yet in the right direction.

The chief faults in the curriculum seemed to us to be its thoroughly disjointed or over-compartmentalized character. It needed integration, both vertically and horizontally. One needed to relate anatomy to biochemistry, structure to function, and to bring both to the bedside. Trite as the saying has become, one needs to study the entire man and the environment he is obliged to inhabit. The study of man is part of general education as well as of professional. It should be the force which blends the two. And blended they should be, from start to finish.

I have long believed also that the dichotomy between college and medical education is undesirable. The student has to transfer from a faculty of arts and sciences, with little interest in or understanding of medicine, to a faculty of medicine with a similar lack of interest in general education. Some arrangement whereby general and professional education can flow along together uninterruptedly from freshman year in college to the doctorate in medicine, always related meaningfully to one another, is, to my mind, urgently needed. The concentration upon medical professional matters to the exclusion of all else, from medical school on, can make the doctor of medicine, as far as society is concerned, a narrow person.

Progress in medicine, and this includes medical education, is largely accomplished by the trial and error method. Observations are made, ideas are generated, then they have to be tried out in practice. If new applications turn out to be good, they survive. If not, ultimately they will be discarded; but some-

times the latter takes a long time. In education, if things are not to remain static, experiments must be tried.

Some medical schools now are making curricular experiments. Notable among these are the University of Colorado and Western Reserve. You here at the University of Kansas have recently rebuilt your first and second year curricula and in your clinical years are making an extensive study of the value of preceptorships—that is to say, farming students out to practitioners for practical experience. I was much interested in Dean Wescoe's recent paper on the subject in the September number of the *Journal of Medical Education*. This type of education has been criticized by such people as Robert F. Loeb and W. Barry Wood, but personally I think it is an experiment that should be tried, and I would postpone judgment until it has had a fair trial. If it is good, it will survive. If it isn't, it won't.

The point of view of the gentlemen I have mentioned is that practical training of this sort at the undergraduate medical school level may jeopardize that thorough grounding in the basic sciences upon which medicine rests and prevent the maintenance of practice at the highest possible scientific levels. I do not believe that this has to happen. Finally, new schools starting from scratch, such as the medical school of the University of Florida or U.C.L.A., have a wonderful opportunity to try out new ideas in methods of medical education.

After medical school comes the house staff experience. In my day the intern was supreme at this level. There were no residents! At the Massachusetts General Hospital we had a 16-months straight medical service (there was a similar one in surgery), organized on a vertical or progressive basis. Each four months we shifted to posts of increasing responsibility. The senior interns in medicine or surgery were the kingpins of their services. They really carried the care of patients; the attending doctors were largely in the role of teachers and consultants. It was a wonderful experience for the lucky ones who obtained such internships, but it was a system which did nothing for fourth year medical students. The latter in those days got little if any genuine responsibility in the care of patients.

In the intervening years all this has changed, and for the better. Toward the end of my internship there arrived in Boston to become medical chief at the Massachusetts General, and professor of clinical medicine at Harvard, Dr. David L. Edsall. Later he became full time dean of the Harvard Medical School. Edsall, like Sedgwick earlier, played a vital role in determining the direction of my career. At once he began making innovations. Together with

Henry A. Christian and Harvey Cushing, he introduced to Boston the clinical clerkship which had recently been imported from Britain by Osler to Hopkins. This was a great advance in medical education because it brought the undergraduate medical student to the bedside and gave him professional responsibility in a way he had never had it before. This was good in my opinion chiefly because the acceptance and meeting of responsibility is one of the most powerful maturing forces we possess. Only last May I had the opportunity to walk the wards of St. Bartholomew's Hospital, London, with British ward clerks, and I looked upon them as the prototype of our own. Their keenness to rest practice on sound theory was similar to that of ours.

Another great advance made by Edsall, Christian, and Cushing lay with the introduction of full time teachers in the clinical subjects. The preclinical subjects had long had full time teachers, on much the same basis as did university faculties of arts and sciences. The clinical teachers in medicine, however, had all been local practitioners, some of great distinction, who gave their teaching services on a voluntary basis and made their living by their practice. Such men were, and still are, of great importance in medical education, but the growing complexity of scientific medicine made it necessary to introduce certain salaried persons who would develop teaching clinics, organize teaching programs, and promote research activities, all of which are essential in the total medicine of today. Along with this was the steady growth and development of the residential hierarchy as an institution for the further education of physicians, surgeons, and medical specialists at the house staff level.

The influence of these new developments on me, although they were but in their infancy, was considerable. Prior to Edsall's arrival, I had taken it for granted that on finishing my internship I would open my office and set myself up in practice. Having previously shifted from biology to medicine, I would go the whole way and practice my profession.

Edsall changed all that. He sold me the idea of going into full time or academic medicine, and I remained in it until reaching the university's retiring age five years ago. I cannot spend much time tonight discussing that long period. I have already given somewhat of my attitude toward medical education. Essentially its objectives are to produce people who will practice medicine, who will teach it, and who will advance the boundaries of medical knowledge by research. Let me now, therefore, say a few words about the last of these—research.

In its essence research may be said to be man's conscious effort to find new facts by exploration, to

relate them one to another, and to derive from them new principles and generalizations. It is the consequence of man's insatiable curiosity and of his innate desire to improve his own lot. In the long range view, progress through research discloses itself as an evolutionary process. We may draw an analogy between the research performed consciously and with intent by man and unconscious research on the part of nature. As man sets up experiments to find new truth, so does nature, in the case of living organisms at least, make experimental types through the process of mutation and test them out in the struggle for existence. Thus we believe has the evolution of species come about, and in similar fashion so has man acquired new knowledge and learned to improve his ways of approaching his objectives. As does nature, under an irresistible drive to procreate, force life to adapt itself to every environment, no matter how inimical, capable of supporting life at all, so does man under his drive to know, inquire into and explore every region of his cosmos to which his sensibilities and his intelligence direct him.

Thus in medicine we have what is called clinical research, which is nothing more or less than scientific inquiry into the causes of disease and the mechanism of morbid processes as we perceive them in our patients, and the search for means of relieving them. In my own experience it was under the influence of Edsall that I first became caught up in the budding clinical research of my early professional days. Patients began to be kept longer in hospital in order that special studies could be made of their cases. New methods of measuring functions were devised. The relation of clinical research to research at the basic science level became a two-way affair. Observations made first on sick individuals sometimes directed the course of basic research into new channels with the consequent formation of new hypotheses and concepts. Or something emerging at the basal level could be put to use for the study or treatment of patients. Development along such lines during the last 40 years in the United States has been prodigious.

During the long stretch of my life in full time medicine after World War I (1919 to 1951), there was no important change in direction. Rather it was a period of intensification of effort along the lines already described. Certain convictions have grown as a result of this experience, as for example, that the more sweetly blended are medical practice, research, and education, the better it will be for everybody. Another is that we need to do research in the social and economic fields of medicine as well as in the biologic. We must devise better methods of bringing high quality medical care to the people, and distrib-

uting its cost. What is best for patients in this regard must take precedence over what is best for doctors.

In 1951 there did come a significant turning point in my professional life. I reached the university's retiring age. And that brings up the last matter I would like to discuss with you, namely the philosophy of retirement. That will give me a chance to bring in Professor Dimond's hobby item. Long before I had reached this point I had been thinking about it, and had arrived at the conclusion that for happiness one should continue to work at something satisfying as long as either God or man will permit. But the pace of work must slacken, and leisure intervene. Leisure itself is a problem: what shall one do with it? The hobby or hobbies can take over part, or all of this, if it or they be truly soul satisfying. There is a point I must make, however, about hobbies. They cannot successfully be developed overnight when the deadline of retirement from a life work has been reached.

The hobby is a tender plant which must be planted early and tenderly nurtured. If so treated it will grow, slowly at first perhaps, but it is all set and ready to grow vigorously when leisure comes. An individual, however, who has worked hectically and competitively may have found no time for leisure or the development of a hobby. Complete retirement for such a one may leave him in a vacuum in which he deteriorates rather rapidly. Professional people are less exposed to this danger than those in a highly

competitive business—positions with enforced retirement ages. It is interesting that Mr. Winston Churchill for many years has been a competent painter in oil. His book, *Painting as a Pastime* is a small masterpiece on the philosophy of hobbies. Every doctor should read and heed it. President Eisenhower paints; also Dr. Killian, the president of Massachusetts Institute of Technology. Yes, you have guessed it—I paint in watercolor myself. I began to do this in 1928 and have been at it, without improving much, but getting great pleasure from it, ever since. It is clearing to the mind and relaxing to the body, to sit and paint a lovely scene.

If the four-day week which Mr. Nixon threatens ever comes to pass, there is going to be a lot of new leisure. It will not come, I am sure, to doctors, but doctors must be prepared to give patients some insights into its possible consequences. Early in life doctors too should develop hobbies which can take up the slack in later life. While they work hard through the prime of their lives, they should relax occasionally with the hobby to keep them company.

I think, ladies and gentlemen, that this will be enough for me to say this evening. I apologize for talking so much about myself, but I really did not know how to avoid this if I was to fill in any measure Professor Dimond's prescription.

I thank you!

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The fundamental qualities for good execution of a plan are, first, naturally, intelligence; then discernment and judgment, which enable one to recognize the best methods to attain it; then singleness of purpose; and, lastly, what is most essential of all, will—stubborn will. A leader is above all things an animator. His thought and faith must be communicated to those he leads. He and they must form as one at the moment of executing a plan. That is the essential condition of success.

—*Marshal Foch*

The Cardiac Pacemaker

Its Use for More Than Seven Months in One Patient

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Because of increasingly frequent reports of successful treatment of cardiac arrest with external electric stimulation,^{1,2,3,4} we are reporting the following case in which the cardiac pacemaker kept the patient alive for more than seven months.

A 30-year-old white male was admitted to the Veterans Administration Hospital, Kansas City, Missouri, on March 29, 1954, as a transfer from another hospital where the diagnosis of Adams-Stokes syndrome had been made. In December, 1953, the patient had had a sudden attack of syncope without any premonition, from which he recovered completely and returned to his work. He had had two similar attacks since.

Past history includes scarlet fever at the age of six. Prior to and following this, the patient had many throat infections. There was no history of rheumatic fever, diphtheria, or syphilis. There was no family history of epilepsy.

Physical examination: The patient was a tall, thin man of the stated age, in acute distress, semicomatose, mildly cyanotic, with no response to questioning or stimuli. The pupils were small and reacted only minimally to light and accommodation. Fundoscopic examination revealed no exudates, hemorrhages, or papilledema.

The blood pressure was 140/70. Pulse was 20 and irregular. Radial pulses were equal bilaterally as were the femoral pulses and the dorsalis pedis. The ventricular rate was 20 per minute, irregular, with frequent ventricular contractions, occasionally in bigeminal sequence. The heart was enlarged. The point of maximal impulse was the sixth intercostal space at the anterior axillary line. No thrills were felt. The heart sounds were distinct with a slow bigeminy; in the interval between ventricular heart sounds, three or four soft sounds could be heard which were interpreted as auricular contractions (fourth heart sound). An extremely high-pitched squeal of short duration was heard in the apical area.

From the Veterans Administration Hospital, Kansas City, Missouri. Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

The mucous membranes were dry and pale. There was good expansion on deep inspiration of the chest. The lung fields were clear to palpation, percussion, and auscultation. Supernumerary mammary glands were present bilaterally. There was no abdominal tenderness. There was no clubbing, cyanosis, or gross deformities of the extremities, and there was no edema. The remainder of the physical examination was within normal limits.

Laboratory and x-ray examination: Chest x-ray showed left ventricular enlargement and no evidence of lung pathology. X-rays of the skull were negative. Upper gastrointestinal series were negative. There was no evidence of hiatus hernia. Intravenous pyelograms were interpreted as showing slight hydronephrosis on the right side.

The patient reported here, a 30-year-old male, was kept alive for more than seven months through the use of the cardiac pacemaker. This is thought to be the longest period of time over which the device has been effective.

Complete blood count was within normal limits. Serology was negative. Blood sugar, nonprotein nitrogen, chlorides, sodium, potassium, CO₂ combining power, calcium, phosphorus, alkaline phosphatase, total protein and A/G ratio were all within normal limits. The total cholesterol was 80 mg. per cent with 37 per cent esters. A repeat cholesterol was 143 mg. per cent with 29 per cent esters. The remainder of the hepatogram was within normal limits. Sedimentation rate was normal. Congo red test for amyloidosis was negative. Lupus erythematosus cell test was negative. Repeated urinalyses were negative. Stool was negative for ova, blood, or parasites. Trichinella skin test was negative. Histoplasmin skin test was positive. Purified protein derivative skin test was negative. Toxoplasmosis skin test was positive, 1:64 dilution. A rheumatogram showed a low-grade degenerative tissue reaction. Bone marrow examination was negative on two occasions. Spinal fluid examination was

within normal limits. Two electroencephalograms were suggestive of diffuse brain damage.

Biopsies of the gastrocnemius and biceps muscles were performed on three separate occasions. Some muscle fibers which appeared somewhat swollen contained fibrillary sarcoplasm, among which scattered vacuoles were encountered. Most muscle fibers appeared normal with well preserved striations. A mild degree of connective tissue edema was observed. The stroma was hypercellular. Scattered throughout were rare, small clusters consisting of lymphocytes, polys, eosinophils, and large mononuclear cells. Fibrinoid degeneration specifically was absent. The wall of the arterioles was slightly thickened. These findings were interpreted by the Pathology Department as questionably compatible with, but not diagnostic of, dermatomyositis.

Electrocardiogram on admission showed a complete heart block. Subsequent electrocardiogram showed a rate of 100, left bundle branch block with a prolongation of the PR interval, left ventricular preponderance, and marked depression of the ST segments in V_3 through V_6 . Many electrocardiograms were taken during the patient's hospitalization with practically the same findings. During the latter part of the patient's hospitalization, attempts to obtain electrocardiograms were unsuccessful inasmuch as the pacemaker was frequently turned on, and when the pacemaker was turned off only auricular contractions with no ventricular response were recorded. An electrocardiogram typical of these attacks of ventricular asystole and ectopic ventricular response with the pacemaker is reproduced (Figure 1).

Hospital course: Oxygen and ephedrine were given on admission and ephedrine was continued, 3/8 grain every two hours, which maintained the pulse at a rate between 90 and 110. The patient was then also placed on Isuprel, 10 mg., sublingually.

On the fourth hospital day he had an episode of profuse sweating without loss of consciousness and

with frequent episodes of ventricular asystole. These episodes were controlled by intravenous injection of epinephrine. In order to control these attacks more effectively, a cardiac pacemaker was made available through the courtesy of the Cardiovascular Laboratory of the University of Kansas Medical Center, and later on the hospital purchased its own pacemaker.

Early in his hospital course, the patient was free from attacks of ventricular asystole for periods as long as 15 days. Between attacks he appeared perfectly normal, felt well, and was well disposed. Occasionally an apical friction rub was heard, especially following exercise, and as the friction rub disappeared, the high-pitched systolic squealing murmur could again be heard at the apex. At other times neither the friction rub nor the murmur was audible.

Because of the almost fixed pupils, a syphilitic gumma was considered, and the patient was given 18 million units of penicillin without any noticeable change.

In June, 1954, the patient began to have more frequent attacks of ventricular asystole with convulsions and was kept on the pacemaker almost continually. He learned how to use the pacemaker and turned it on frequently himself when he was feeling the onset of the attacks of ventricular asystole, because he was afraid the physician or nurse might arrive too late. He was digitalized, and atropine and Pronestyl were added to his treatment, without any noticeable change.

A trial with cortisone and ACTH was made without improvement. During the last few weeks of hospitalization the pacemaker was continuously required because the patient had frequent episodes of ventricular asystole and syncope, sometimes as many as 10 to 15 attacks a day. He developed numerous minor burns at the site of the chest electrodes and was treated with topical application of gentian violet. In the middle of November it became necessary to make a substantial increase in the voltage of the pacemaker in order to obtain a heart beat. Nevertheless, the patient began to have repeated heart blocks and finally expired.

Postmortem Examination

Gross autopsy findings: The body was that of a lean, tall, young, white male. The cardiothoracic ratio was 15/28. The abdominal viscera were in a normal position and not adherent to each other. The lungs showed a slight amount of congestion but no evidence of aspiration, inflammation, infection, or tumor.

The heart was enlarged and weighed 510 grams. The epicardium was smooth and shiny. No hemorrhage, exudate, or scarring was present. The heart was more flabby than usual. When sectioned, it offered a slight meaty resistance. The myocardium was

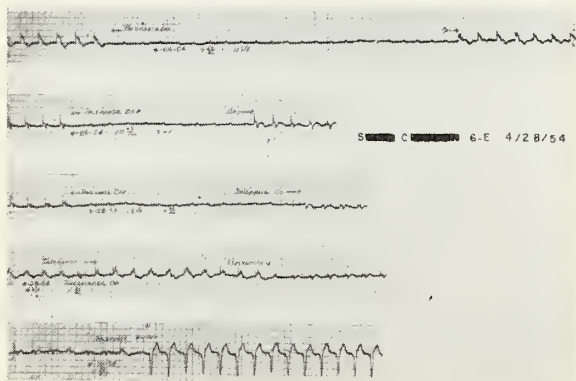


Figure 1

red-brown. The columnae carnae were moderately hypertrophied, and the papillary muscles were markedly so. The left ventricle measured 2 cms. in thickness, the septum 1.8, and the right ventricle .2 cms. All chambers were markedly dilated. The lining endocardium was thin and smooth. No thrombi were present. The foramen ovale was closed. There were no interventricular septal defects. The mitral and tricuspid valves were slightly dilated, with no calcification; neither was the aortic ring calcified or sclerotic. The only abnormality was a minimal (1 by 1 mm.) sclerosis in one leaflet of the mitral valve at the free edge. The coronary arteries were patent. Cut section of the myocardium showed no areas of softening, hemorrhage, or infarction.

The aorta showed a small, smooth plaque of atherosclerotic deposition, also approximately 1 by 1 mm., at the level of the orifices of the renal arteries, but no other atherosclerosis.

The brain showed no areas of scarring, tumors, or inflammation. The vessels at the base of the brain were free from any atherosclerotic disease, and no other anomalies were present.

The remainder of the gross anatomical examination was not remarkable.

Microscopic examination: Cardiovascular System—The mitral valve and the ring had some scattered vacuolization and one small area of calcification, approximately the size of an erythrocyte. Some vacuoles were also seen in the interstitial tissue. There seemed to be little evidence of increase in the interstitial fibrous tissue. There were eosinophiles scattered at widely spaced intervals.

The spleen showed much eosinophilic interstitial material with a large number of immature eosinophiles.

The adrenals were not remarkable. The muscle showed isolated vacuoles, presumably representing fat, scattered through the myofibrils.

Neither the bone marrow nor the brain showed any abnormalities.

In summary, then, this patient showed minute areas of calcification at the free edge of the mitral valve, and there were minor changes consisting of scattered eosinophiles, fat, vacuoles, and myofibrillary changes.

The changes in the vessel walls of the spleen and muscle, while not inconsistent with a beginning collagen disease, were by no means diagnostic. On the basis of the anatomical findings presented, the pathologists stated that it was not evident why the heart showed the degree of hypertrophy and dilation found at autopsy.

Unfortunately a detailed histological examination of the A-V node could not be performed as intended. Only the routine microscopic examination of the heart was done.

Discussion: It is obvious that the attacks of Adams-Stokes syndrome were due to anoxia of the conduction system. We were at a loss, however, to determine the underlying anatomic-pathologic condition responsible for the production of the anoxia, as we were at a loss to determine the precipitating mechanism causing these attacks.

Many conditions have been considered in the differential diagnosis, such as A-V block due to acyanotic congenital heart disease, congenital anomalies of the coronary arteries, subendocardial fibroelastosis, syphilis, tuberculosis, histoplasmosis, toxoplasmosis, so called primary amyloidosis of the heart, glycogen cardiomegaly, sarcoidosis, porphyria, tumor of the heart; either primary or secondary, diseases of the collagen group, "idiopathic" myocarditis and "idiopathic" ventricular hypertrophy.

Idiopathic myocarditis and idiopathic ventricular hypertrophy were the most seriously considered conditions in the differential diagnosis, and postmortem examination revealed left ventricular hypertrophy.

Mesotheliomas of the myocardium involving the region of the bundle of His, with clinical manifestations of Adams-Stokes attacks occur occasionally.^{5,6,7,8} A tiny mesothelioma limited exclusively to the A-V node cannot be definitely ruled out since no detailed examination of the A-V node was performed. However, routine microscopic examination of the patient's heart failed to reveal mesothelioma cells elsewhere.

Because of the biopsy report of a gastrocnemius muscle suggestive of collagen disease, especially dermatomyositis, the possibility of that or of any other disease of the collagen group had to be seriously considered during the patient's life. However, the postmortem microscopic examination failed to establish any clear-cut evidence of collagen disease, although the changes in the vessel walls of the spleen and muscle, the minor swelling of the muscle fibers with the scattered vacuoles, and the minor degree of connective tissue edema were considered by those in the Pathology Department as not inconsistent with a beginning collagen disease. But they were by no means considered as diagnostic.

The pathologists could not find any pathological basis for the hypertrophy and dilation of the heart found at autopsy. One of the consultants in pathology who reviewed the slides stated that he would certainly not have made the diagnosis of collagen disease had this possibility not been called to his attention by another physician. The slides were also reviewed by Dr. Helwig,* and it was his opinion that the microscopic examination does not allow the diagnosis of even an incipient collagen disease.

* Appreciation is expressed to Dr. Ferdinand C. Helwig, consultant in pathology, Veterans Administration Center, Wadsworth, for having reviewed the slides.

There have been reports in the literature of cases of cardiac hypertrophy of unknown cause.^{9,10,11,12,13,14} Those cases were patients with heart failure of unexplained origin in whom postmortem examination revealed ventricular hypertrophy with vacuolization and some dilation of the muscle fibers, whereas the coronary arteries were patent. Yet they all showed some underlying condition such as interstitial emphysema, fibrosis, hypertension, bronchial asthma (in the cases reported by Levi and Van Glahn⁹), or mural thrombi and thromboses of the thebesian vessels (in the cases reported by Flynn and Mann¹⁰).

Of the 49 cases of so-called idiopathic ventricular hypertrophy referred to above, not one, to our knowledge, showed clinical features comparable to those shown by our patient.

Whatever the cause and the underlying mechanism for production of the attack of Adams-Stokes syndrome, the fact remains that the patient was kept alive for seven months because of the pacemaker.

Although we do not have proof, it is our firm belief that the usual medications such as intracardiac adrenalin, Isuprel, etc., would not have stopped the attacks; if it were not for the cardiac pacemaker, the patient would have succumbed much earlier during one of his attacks.

The cardiac pacemaker was used according to the technique as described by Zoll.¹

Several series of patients with various types of cardiac arrest and Adams-Stokes syndrome have been described in which the artificial electric pacemaker has been used with success,^{1,2,3,4} even up to a period of seven days.¹⁵ We believe the case presented here represents the longest period of almost continuous use of the pacemaker. It was effective inasmuch as it produced a ventricular ectopic contraction. While it was not a regular contraction of the ventricle through the normal A-V conduction system, it was nevertheless effective enough to produce a contraction of the myocardium and eject blood from the ventricle into the peripheral circulation.

At the onset of attacks of the Adams-Stokes syndrome, the patient's face and hands showed a snow-white pallor and he became weak and sometimes unconscious. Almost immediately after the cardiac pacemaker was turned on, his color and his consciousness returned and he felt better. Usually the patient could sense when his own cardiac rhythm was restored and the pacemaker could be discontinued, as he could also determine when the voltage of the pacemaker should be increased or decreased.

Unfortunately, after having been in use for the above mentioned period, the cardiac pacemaker was not effective in preventing the fatal outcome during one of his attacks of ventricular asystole. It is known

that after a patient is continuously on the pacemaker for a certain length of time, the contraction becomes gradually less effective.²

Summary

A patient with attacks of Adams-Stokes syndrome of unknown cause is presented. Clinical examination showed left ventricular hypertrophy and postmortem examination, including a routine microscopic examination of the heart, disclosed only left ventricular hypertrophy of unknown cause. Unfortunately it was not possible to perform a detailed microscopic examination of the A-V node.

The patient was kept almost continually on the pacemaker for more than seven months which, to the best of our knowledge, is the longest period of time for the use of the pacemaker.

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Poisoning

A Study of 293 Patients Seen at One Hospital in a Two-Year Period

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The Committee on Child Welfare of the Kansas Medical Society has been interested in establishing a poison control center in some of the larger communities of Kansas. The Kansas Chapter of the Academy of Pediatrics, in addition to some lay organizations and agencies in certain communities, has also been pursuing this goal. In an effort to determine whether the need for such a center exists in Wichita, the author undertook to examine the outpatient records at Wesley Hospital in this city.

By the term "outpatient" the author means "patient visits" to the Emergency Room in this hospital for whatever reason. In the years 1955 and 1956 there were 35,589 such patient appearances. On each visit a card was filled out with a notation as to the type of complaint, the nature of the accident, the treatment proffered, and the disposition of the patient. The cards were then filed in the Emergency Room office by weeks in an alphabetical fashion.

From inspection of the cards it is impossible to determine what transpires after the patient leaves the hospital, and, as there is no effort made to code the diagnosis according to the Standard Nomenclature of Disease, it is occasionally difficult to tell exactly what is meant by certain notations. Unfortunately, such a state of affairs is occasionally true with the more formalized inpatient records as well. However, review of these records does give at least a partial picture of how important immediate information regarding poisons and poisonous products might be in this type of medical practice.

Not all of these problems are met in the Emergency Room, of course, and not all of them in the usual working hours. But because the Emergency Room is open 24 hours a day, and because the patient often first thinks of hastening to the hospital, it appears that the logical place for the location of a poison control center is there.

For the purpose of this investigation, contact poisons such as poison ivy or poison oak, stings of insects, bites of spiders, and intoxication from alcohol are omitted. Likewise patients who presented themselves because of insulin reaction are not included. Thus the study is limited to ingested medications with toxic actions, miscellaneous products with poisonous potentialities, inhaled poisons, and ingested poisonous plants.

Out of the total number of 35,589 patient visits there were 293 patients with a suspected or known poison problem, or 0.82 per cent of this local patient population. For comparison purposes it might be noted that at the same time there were 82 patients with foreign bodies in the stomach, 67 with foreign bodies in the throat, 63 with foreign bodies in the nose, and 32 with a similar problem with the ears. And in passing it was noted that in this group there were four males of assorted ages who made an emergency room appearance for the reason that the penis was caught in the trouser zipper (0.01 per cent).

The 293 patients with a poison problem were almost equally divided between the sexes: 51 per cent were males, and 49 per cent were females. The list includes 65 (22 per cent) adults and 228 (78 per cent) children.

The need for establishment of a poison control center in Wichita is apparent from an analysis of patients seen at Wesley Hospital, Wichita, during 1955 and 1956 for complaints referable to ingestion and inhalation of toxic substances.

As might be expected in the older age classification, the ingestion of many toxic items was purposeful. While it is manifestly difficult to ascertain from several of the records if the purpose was suicide, one might assume that in the majority of instances it was, or at least it was meant to look like it was. In this group there are 58 patients. One-half, or 29, elected to accomplish the purpose by the ingestion of barbiturates. Hospitalization was ordered for 26, while three were treated and sent home.

Aspirin in massive doses was preferred by seven individuals. Their action necessitated the admittance of two, while five were discharged. In two cases Clorox was the selected agent, and both patients were admitted. In the two instances in which Lysol was used, one was admitted. An undiagnosed agent was responsible for the appearance of three patients. Lavage and the use of the universal antidote permitted one to return home, while the other two

were admitted for further study. The remaining patients tried the following substances one time each: hemlock leaves and plant substance, floor cleaner, large quantity of thyroid extract, Dexamyl or Dexedrine tablets, potassium permanganate solution, Mercurochrome, iodine, permanent wave neutralizer, chloral hydrate, bug poison, copper sulphate solution, turpentine, Sani-Flush, and Johnson's floor wax.

The procedural technique most frequently used in this group for therapeutic ends was that of gastric lavage. This was accomplished 41 times, while apomorphine was used twice and ipecac once. Caffeine sodium benzoate was administered eight times, Metrazol in three instances, and Sodium Amytal and magnesium sulphate in two patients each. Morphine, sodium thiosulphate, universal antidote, Synkavite, Nalline, picrotoxin, and starch solution were employed once each. In all, of this group of 58 adults, 39 were admitted for further treatment.

Of the remaining adults appearing on the list—seven in all—only two were detained. This group was composed of patients who were presumed to be poisoned by inhaled gases. Sulfur gas, fumes from a fat disposer, and carbon monoxide gas were the only gases mentioned in the emergency room records.

Among the children seen (228), the most commonly mentioned ingredient with toxic potentialities was aspirin. Accidental ingestion of this drug accounted for the appearance of 84 patients. The stated age varied from six months to six years. In the age range of six to eleven months, there was one victim. In the age range from 12 to 23 months, these were 15; in the 24- to 35-month range, there were 40 sufferers; and above this age period there were 28. As might be expected, the sex variation was slight; 40 of the children were females and 44 were males. It is also evident that the age of approximately 36 months is the peak age of curiosity for these small patients. Of this group, three were sent into the hospital, lavage was employed 74 times, ipecac given two times, apomorphine one time, sodium bicarbonate once, and the universal antidote once. In five instances no specific therapeutic measures were undertaken.

Aspirin is common around the home, of course, and the inquisitive child may often witness an adult taking it. Likewise the child may be aware that the adult takes other specific medications of various sorts—often at mealtime—and hence may feel obliged to try some too. This type of medication experimentally taken was responsible for the appearance of 42 other children.

Dexedrine intoxication was the reason for one admission, and barbiturate poisoning caused the admission of two patients. The remainder were sent home. No specific therapy was offered for four,

ipecac was administered in two, apomorphine given in two, and lavage accomplished in 35. In one instance each Butisol sodium, Luminal, Coramine, penicillin, and universal antidote were therapeutically employed.

The medications taken, with the number of times they were involved indicated in parentheses, were as follows: unknown (8), Ex-Lax (8), barbiturates (7), thyroid extract (4), reducing pills (2), antihistamine (2), prescription for cold (2), Dexedrine (1), bile salts (1), Dramamine (1), Alka-Seltzer (1), Anti-Colic prescription (1), ephedrine (1), Demerol (1), paregoric (1), diethylstilbestrol plus penicillin tablets (1) and creomulsion (1).

The children consumed quite a number of miscellaneous items as well. For this type of complaint there were 102 visitors. Chief among this type of offending substances were the distillates—gasoline, kerosene, and turpentine. There were 15 who had consumed this type of toxin; three were admitted. Next in the list were insecticides, and there were nine so afflicted. Furniture polish was the offender in six. Rubbing alcohol and "rat" poisons each accounted for five patient appearances. One of the rat poison patients was hospitalized. Cleaning fluids prompted four visits, and talcum powder forced the appearance of three. One of the latter group was admitted, as was one of the three patients who had eaten moth crystals or moth balls. "Poisoned food" appears on three records, but it is impossible to ascertain the nature of the "poison." All three patients were lavaged and then dismissed.

Sani-Flush, Pine-Sol disinfectant, Mercurochrome, castor beans, match tops, nail polish remover, and unknown substances caused two patients in each category to make a visit. One of those in whom the substance was unknown was sent into the hospital. Drano was ingested by one, and he was admitted. There was one case each of the following type of ingested poisons: acetic acid, ammonia, arsenate of lead, astringent, berries of an unknown type, bitter-sweet, bluing, boric acid, detergent of a liquid variety, "Dip-It," fertilizer of the solid variety, Glass Wax, "Hypo" solution, ink, ivory soap, lotion for hand applications, Lysol, Murine, oil, plant solvent, shoe polish of the liquid type, plant of poisonous nature, sunflower seeds, toothpaste, turpentine paste, and weed killer.

It is not surprising that in this group the situation was serious enough to require the admission of eight children, while 94 were sent back home after examination and treatment. The plan of therapy for this series of emergencies was gastric lavage in 72 instances, apomorphine in three cases, and ipecac administration in two. The universal antidote was em-

ployed in four situations, while magnesium sulphate, Hykinone, intramuscular penicillin, and vinegar were the agents used in two problems each. Dramamine, intravenous penicillin, and sodium bicarbonate each found a use on one occasion. Nineteen patients were examined and then dismissed.

In total then, over the two-year period, 41 adults were admitted for more therapy and observation and 14 children were admitted, or a total of 55 patients—0.15 per cent of the outpatients seen. However, more than 55 patients were discharged from the hospital with a diagnosis of poisoning established in this interval of time.

There were 113 such cases among 31,670 admissions, or an incidence of 0.35 per cent. Some of these cases were direct admissions and hence do not appear on emergency room records, while others were those in whom a diagnosis was not initially stated, or was discovered after the admission was accomplished. Ninety-four (83 per cent) were adults and 19 (17 per cent) were of the pediatric classification. Forty-nine males and 64 females comprise this group that collectively spent 820 days in the hospital.

The list of offending substances in the adult list is quite long. In parentheses are the numbers of times the agents appear. The list is as follows: barbiturates (14), undiagnosed (12), digitalis (9), bromine (7), Thorazine (7), Dicumarol (6), organic poison of fatty series (5), sulfonamides (3), chloral hydrate (2), serum reaction (2), spider bite (2), carbon monoxide (2), aspirin (2), hydrochloric acid (2), cocaine group (2), undetermined type of poison gas (1), hyperallergic reaction (1), undetermined type of vegetable poison (1), Dexedrine (1), potassium permanganate solution (1), thiamine (1), rauwolfia

(1), varidase (1), phenol (1), ambrozoin (1), ammonia (1), camphor (1), penicillin (1), scopolamine (1), Serpasil (1), wasp sting (1), resin of unspecified type (1), sodium fluoride (1), Pavine (1), and an aniline derivative (1).

In this number there were three fatalities. A mixture of potassium permanganate, arsenical rodenticide, and a bug killer was employed as a lethal agent in a 28-year-old adult, and sodium fluoride was effective as a suicidal means in a 32-year-old patient. An adult of 55 years was the third member of this trio. Hospital records reveal that intensive therapy was employed in the first two acute cases. Their hospital stay was six and nine hours, respectively, before death supervened. The record indicates that digitalis intoxication was but one of the several contributory causes for the death of the third patient on the 16th hospital day. It seems there would have been no benefit accruing to these patients from a poison control center even if such had been in operation at the time.

In the group of hospitalized children the toxicants were aspirin (4), gasoline (3), undiagnosed (2), plant with poisonous effect (2), barbiturates (2), nitric acid (1), Mebaral (1), digitalis (1), and castor bean (1). There were no deaths.

It would be foolhardy to project the experience in one emergency room to the entire poison problem in this city. Yet the more readily available information for counteracting toxicants is, the more the opportunity of reducing mortality rate, and perhaps the morbidity rate as well. Such an effect should be made through the establishment of a poison control center.

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The wise men of antiquity, when they wished to make the whole world peaceful and happy, first put their own States into proper order. Before putting their States into proper order, they regulated their own families. Before regulating their families, they regulated themselves. Before regulating themselves, they tried to be sincere in their thoughts. Before being sincere in their thoughts, they tried to see things exactly as they really were.

—Confucius

Outpatient Psychiatry

A Study of Initial Contacts with Adults at a State Hospital Clinic

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The Adult Outpatient Clinic of the Topeka State Hospital started functioning in 1951. From 1951 to 1956 about 1,035 persons came to the clinic for help. The clinic is located in a community which is psychiatrically sophisticated and has a number of established and recognized psychiatric facilities such as the Menninger Foundation, the Winter Veterans Administration Hospital with its Mental Hygiene Clinic, the Shawnee Guidance Center, and the Family Service Agency. We will describe briefly the structure and functioning of the Adult Outpatient Clinic of the Topeka State Hospital.

Structure of the Clinic

The clinic has a full time director, assisted by two full time assistant directors. Each of the assistant directors supervises, on an average, five psychiatric residents, one staff psychologist, one psychiatric social worker, and a secretary. These constitute a team. Thus there are two teams, each operating as a unit within itself. The resident psychiatrists usually change service on either July 1 or January 1, after a six months' or a year's stay in the clinic for residency training.

Functioning of the Clinic

Anyone over 18 years of age who feels that the clinic may be able to help him or his friend or relative with emotional problems may contact the clinic in person, by letter, or by telephone. Usually the social worker takes care of these contacts and as soon as possible arranges a meeting during which pertinent information is gathered. The social worker interviews the relatives, if possible, to obtain a clearer picture of the problem. The patient is then informed that an intake conference will be arranged at which he will be seen by one doctor and his relative by another doctor. There is usually an interval of about one week between the time the social worker sees the patient for the pre-intake and the time of the intake conference. Before the two doctors connected with the case see the patient and the relative they receive from the social worker the information she has already collected. This is the standard procedure

followed at the clinic with minor variations tailored to the needs of an emergency problem.

At the intake interview one doctor sees the patient for about 30 minutes while another doctor simultaneously sees the relative. At these meetings information is collected to answer some broad questions such as:

Can the patient be treated on an outpatient basis?

Is there a suicidal risk? If so, to what degree?

Are there factors which could prevent the patient from coming to the clinic?

What is the degree of the patient's psychological mindedness and his motivation for seeking help?

What is the attitude of the relatives toward the patient and his problem?

This study was undertaken to learn why patients who present themselves to a psychiatric clinic on an outpatient basis often fail to return for the help they have requested. It appears that patients referred by medical and psychiatric agencies are more likely to complete the evaluation procedure than are those who report on their own initiative. Highly educated patients have better completion records than those with little education. The program of interviews and evaluation is outlined.

A date is set tentatively for a diagnostic and appraisal conference. The average evaluation period lasts from four to six weeks, and the patient is usually seen once a week during this period.

After the intake conference the respective doctors inform the patient and the relative about the deliberation of the conference and answer questions that may arise. The doctor who sees the patient discusses with him the fee that will be charged for every hour that he will be seen at the clinic. In case the relative is seen at the clinic, either to collect information or to give support or understanding of the patient's problem, he is charged the same hourly fee as the patient.

The clinic believes firmly that patients should be charged for professional services rendered. The clinic

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has a reasonable¹ sliding scale fee schedule which takes into consideration the patient's gross income and the number of dependents he has.² The fee schedule is flexible, and the ultimate fee is determined by the doctor after consideration of the over-all situation of the patient. In some cases no fee at all or one as low as 25 cents an hour is charged.

No physical examination is given by the doctors at the clinic. If such examination is needed, the patient is requested to have one performed by his family physician. If neurological examinations or laboratory investigations such as electroencephalograms or skull x-rays are needed, the facilities available at the Topeka State Hospital are utilized.

Aim of the Study

The procedure in any adult psychiatric outpatient clinic varies considerably from one institution to another. The variation is due to (1) the inherent difficulty of trying to meet the treatment needs of the psychiatric patient and (2) the desire to foster the "working together" relationship of the clinic and the community. "The independent clinic with its greater degree of freedom to restrict patient service time runs the risk of isolating itself by forgetting the needs of the total community and overlooking the mental health aspects of the community."³

Public clinics, like the one at Topeka State Hospital, on the other hand, are confronted with tremendous patient loads because of an obligation to accept for service anyone who comes along from the area served. It seemed to me, therefore, that an analysis of patients who came to the Outpatient Clinic at Topeka State Hospital may bring forth certain conclusions which would be useful, not only to this clinic in future, but perhaps to public psychiatric clinics in general. The study was limited to the initial six weeks' contact of patients with the clinic with a view of finding out how our particular intake procedure affected patients in their early associations with the clinic.

Plan of Study

The author studied records of patients who came to the clinic during the 1956 calendar year. Attention was restricted to information from the time the patient first made contact with the clinic until he was presented at the diagnostic and appraisal conference.

Results and Discussion

1. Three hundred thirteen persons made contact with the clinic, but only 205 came for the pre-intake meeting. More than one third (108) did not come for the pre-intake conference. The records of those 108 cases are scanty since many contacts were made by telephone. Therefore it is difficult to determine the

factors responsible for this significant dropping out.

One patient who was brought to the clinic by his brother told the social worker, "I detest being examined at the state hospital." The fact that this clinic is attached to the state hospital creates more difficulties for the patient than if the clinic were elsewhere in the community. Popular prejudice against a state hospital still exists. This factor might keep some patients away from this clinic.

2. A total of 36 patients (16 males and 20 females) did not complete the evaluation procedure, i.e., pre-intake, intake, evaluation interviews, diagnostic and appraisal conference. One hundred sixty-nine completed the procedure. Of these, 77 were males and 92 were females. The 36 patients who dropped out did so for many reasons, discussed in detail in subsequent headings.

It should be mentioned that though the psychiatrist uses the term "evaluation," his concept of that word and the concept of the patient or the relative may not be the same. It was found in a few instances that the patient considered the term "evaluation" as a criticism or a judgment, which viewpoint made it difficult for him to follow through the procedure. It is possible that use of the traditional word "examination," which has a medical origin, may perhaps suit the purpose better.

Another factor worthy of mention is that evaluation interviews aimed at collation of data made the patient tense or defensive in some instances. There is a temptation for the doctor to get a detailed history so that he can make a meaningful presentation at the staff conference. This approach was found in some instances to be "penny wise and pound foolish" since it caused some patients to drop out of the evaluation procedure. On the other hand, in some patients this approach was found to be useful since it lent structure to the evaluation interviews and diminished the intensity of the transference relationship. The technique during the evaluation interviews, therefore, should be flexible to suit the special problems presented by each patient with the object of helping him complete the evaluation procedure.

Of 169 who were considered to have completed the procedure, 58 were given definite instructions and appropriately disposed of; for example, recommendation was made for hospitalization, or boarding home placement, or suitable environmental manipulation. In these cases it was the impression of the staff that psychotherapy was not indicated.

3. Table I shows how distance from their home to the clinic affected patients who completed or failed to complete the evaluation procedures.

The table shows clearly that 63.4 per cent of the 205 patients came from within a radius of 50 miles from the clinic, and this number dropped significantly

TABLE I
DISTANCE IN MILES FROM HOME TO THE CLINIC

| <i>Miles</i> | <i>Completed Evaluation</i> | <i>Did Not Complete Evaluation</i> | <i>Total</i> | <i>Percentage of Incomplete Cases</i> |
|--------------|-----------------------------|------------------------------------|--------------|---------------------------------------|
| 50 | 130 | 19 | 149 | 12.7 |
| 100 | 27 | 10 | 37 | 27.0 |
| 150 | 9 | 4 | 13 | 30.7 |
| 200 | 2 | 2 | 4 | 50.0 |
| 250 | 1 | 1 | 2 | 50.0 |
| Total | 169 | 36 | 205 | 17.5 |

as the distance increased. The number of patients who dropped out during the evaluation was 12.7 per cent for the first 50 miles, and this drop increased to 27.02 per cent as the distance doubled to 100 miles. This correlation is significant and easily understandable.

4. Patients were studied in terms of the source of referral. Fifty patients came to the clinic by themselves (hence called self-referrals). Of these, 43 completed evaluation and 7 did not. Eleven patients came to the clinic at the insistence of friends and relatives; of these, 10 completed evaluation and 1 did not.

Psychiatric agency referrals include patients referred to the clinic by:

(a) Admissions Committee of the Topeka State Hospital. These patients applied for hospitalization, but the committee which reviews all such requests felt that a preliminary evaluation by the outpatient clinic would be helpful in assessing the situation.

(b) Psychiatric resident physicians of Topeka State Hospital who felt that some patients under their charge would profit by psychotherapy.

(c) Division of Institutional Management of the state of Kansas.

(d) Menninger Clinic.

In all, 67 patients were referred by psychiatric agencies; of these, 56 patients completed evaluation and 11 did not.

Fifty-five patients were referred to the clinic by medical agencies, physicians, local hospitals, and sanatoria. Of these, 43 patients completed evaluation and 12 did not.

County welfare departments referred 16 patients, 12 of whom completed evaluation. Most of these patients were referred so that we might find out whether they were eligible for financial assistance from these agencies on the basis of their psychiatric difficulties.

Six patients were referred by the court, 5 of whom completed evaluation. Some patients who were re-

ferred here by court stayed through the evaluation since they felt that by this procedure they might receive a less severe sentence. In other instances the patient put the psychiatrist in the role of a referee between him and the court. When the patient found that the psychiatrist refused to take sides, insisting that his function was to help the patient with his emotional problems, the patient left the evaluation.

Analysis of patients in terms of referrals showed that those who came at the insistence of friends or relatives followed through the evaluation procedure better than others, but the total number is too small to draw any valid conclusions. Most of these were patients with depressive reactions, and it is inferred that the relatives were more particular about cooperating with the clinic because of the possible danger of suicide.

Of 123 patients who originally contacted the clinic either by themselves or at the insistence of their friends or relatives, only 61, 50 per cent, came for pre-intake, and 53 of these, 86.9 per cent, completed the evaluation procedure. On the other hand, 149 patients made first contact with the clinic at the insistence of psychiatric and medical agencies; 122 of these, 81.9 per cent, came for pre-intake, and 99 completed the evaluation procedure. In a way, all psychiatric and medical agency referrals are self or relative referrals since the patients made a first "stop over" at these agencies before they were referred to the clinic. These patients or their relatives were sufficiently aware of the difficulty and had a measure of motivation to seek help, but it seems that going to private physicians or psychiatrists equips them better to follow through the evaluation procedure at the clinic than if they had come to the clinic directly.

One unusual self referred patient said, "I have no problems to talk about, my work seems a pleasure, and I have come here only to find out how this outpatient clinic works in case I have trouble later on."

5. Patients were studied in terms of educational background. Twenty-seven had received grade school education; 19 completed evaluation and 8 did not. One hundred sixteen had received high school education, 93 completing the evaluation and 23 not doing so. Forty-nine had received college education, 45 of whom completed evaluation and 4 of whom did not. Thirteen patients continued their studies after completing college, and of these 12 completed evaluation and 1 did not.

It is understandable that patients with more education had a greater degree of awareness of their problems and better appreciation of the nature of the help that the clinic offers. This is reflected in the number of patients following through evaluation.

6. Patients were studied in terms of occupation. When a patient held two occupations simultaneously, such as being a housewife and a secretary, she was classified in the one which the author considered to be primary, in this instance that of being a housewife. An 18-year-old man who was a student and worked part-time at a gas station was classified as a student. Thirteen of our patients were unemployed, and of these 7 completed the evaluation and 6 did not. Sixty-four were housewives, 50 of whom completed evaluation and 14 did not. Twenty-one were students, 20 of whom completed evaluation and 1 did not. Eleven were farmers, 9 of whom completed evaluation and 2 did not. Twenty-three were unskilled workers, 18 of whom completed evaluation and 5 did not. Professors, lawyers, secretaries, clerk-typists, and switchboard operators were considered as professional workers. Seventy-three patients fell into this category, and 65 of these completed evaluation and 8 did not.

Although the clinic serves an area which consists of farmers predominantly, the number of farmers who sought help at the clinic was significantly small. Some factors discussed above, such as education and distance from the clinic, could explain part of the story.

The findings in terms of education and occupation point conclusively to the fact that patients with higher education are able to complete evaluation more successfully than those with less education.

7. It was intended to find out whether changes in resident psychiatrists which occurred predominantly around July 1 and January 1 affected the patients in terms of their following through with evaluation procedures. During the latter half of the months of May and November and all during the months of June and December, urgent cases are scheduled for intake and if possible followed through evaluation as soon as possible. The remaining patients are informed that they may be seen for intake but that evaluation interviews will start after July 1 or January 1, as the case may be. Between January 1 and March 31, a total of 49 patients came for pre-intake, and 42 of these completed the evaluation procedure and 7 did not. Forty-six patients came between April 1 and June 30, and 34 completed evaluation and 12 did not. Seventy-four came between July 1 and September 30, and 59 of these completed evaluation and 15 did not. From October 1 to December 31, 36 patients came for pre-intake and 34 of these completed evaluation and 2 did not.

Changes in resident psychiatrists around July 1 and January 1 do not seem to influence significantly the number of patients following through their evaluation procedures.

8. Table II classifies patients according to the diagnosis as defined by the American Psychiatric Association.⁴

TABLE II
CLASSIFICATION OF PATIENTS IN TERMS
OF DIAGNOSIS

| <i>Diagnosis</i> | <i>Com- plete</i> | <i>Incom- plete</i> | <i>Total</i> |
|---|-----------------------|-------------------------|--------------|
| 1. Chronic Brain Syndrome | 17 | 4 | 21 |
| 2. Mental Deficiency | 3 | 1 | 4 |
| 3. Affective Reactions | 3 | — | 3 |
| 4. Schizophrenic Reactions | | | |
| a. Paranoid | 4 | 1 | 5 |
| b. Catatonic | 3 | — | 3 |
| c. Acute Undifferentiated | 3 | 1 | 4 |
| d. Chronic Undifferentiated | 8 | 2 | 10 |
| e. Schizo Affective | 3 | 1 | 4 |
| 5. Psycho Physiologic Reactions | 1 | 1 | 2 |
| 6. Psychoneurotic Reactions | | | |
| a. Anxiety Reactions | 35 | 2 | 37 |
| b. Dissociation Reactions | 1 | — | 1 |
| c. Conversion Reactions | 4 | 1 | 5 |
| d. Phobic Reactions | 1 | 1 | 2 |
| e. Obsessive Compulsive Reactions | 8 | — | 8 |
| f. Depressive Reactions | 34 | 11 | 45 |
| 7. Personality Disorders | 37 | 8 | 45 |
| 8. Adjustment Reactions of Adolescence | 4 | 2 | 6 |
| Total | 169 | 36 | 205 |

The number of patients in each category is too small to draw any valid conclusions, but certain broad observations may be made. The table shows that over 50 per cent of the patients came from the group with anxiety reactions, depressive reactions, and personality disorders. In this series patients with anxiety reactions followed through the evaluation procedure better than patients in the other two categories. It was also noted that during evaluation eight patients with depressive symptoms experienced amelioration of their symptoms; this in turn diminished motivation for seeking further psychiatric help. Of thirty-four patients listed under the "complete" column in depressive reactions, 6 were given instructions somewhat similar to those given in-patients of Topeka State Hospital under the treatment prescription of "Anti Depressive Regime."⁵ This approach was found to be helpful, and it was possible to maintain these patients outside the hospital.

In the majority of cases the tentative diagnosis made at the intake conference did not differ from

that made at the diagnostic and appraisal conference.

Summary and Conclusions

The study was undertaken to learn why some patients drop out of the evaluation procedure. It concerns itself only with non-personal aspects of the problem, not taking into consideration the highly complex and challenging personal aspect, namely the interaction between the patient and the doctor. The attitude with which the patient looks upon his doctor, his fears, prejudices, and biases, and the attitude with which the doctor looks upon his patient, play an important part in determining whether or not the patient will follow through evaluation, but these aspects of the problem are not considered in this paper.

The conclusions of the study are:

1. Fifty-eight of 169 patients were given appropriate recommendations during the evaluation procedure, indicating the usefulness of the procedure.
2. The clinic facilities are utilized mostly by those within a radius of 50 miles.
3. Those referred by medical and psychiatric agencies complete the evaluation procedure better than others.

4. Patients with higher education have better chances of completing the evaluation procedure.

5. Change in resident staff in January and July does not seem to affect the dropping out of patients during their evaluation.

6. Over 50 per cent of the patients are in groups of anxiety reaction, depressive reaction, and personality disorder. Patients carrying the diagnosis of anxiety reaction follow through evaluation better than the others.

Osawatomie State Hospital
Osawatomie, Kansas

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It is meet and proper that a nation should set apart an annual day for national giving of thanks. It is a public recognition of God as the Author of all prosperity. It is the erection of a memorial to the honor of Him who has led us through another year. The annual proclamations . . . of thanksgiving are calculated to remind the people of their indebtedness to God, to stir in their minds and hearts emotions of gratitude and praise and to call out thanks and sincere worship which otherwise might not find expression.

—Rev. Dr. J. R. Miller



The increasing number of accidents on our highways has stimulated the organization of groups which are engaged in an educational program aimed at the prevention of many of our present-day accidents. In addition, the various highway departments are active in accident prevention and distribute many pamphlets and papers which contain good advice to drivers and pedestrians alike. Following are some quotations from a recent bulletin from our State Highway Commission, giving rules for accident-free driving, as quoted from Harold Smith in a recently released film, "The Smith System of No-Accident Driving."

1. Aim high in steering—Most drivers hug the left edge of their lane because they steer by watching low along the left edge of the lane. This fear of hazards on the right is the reason for lane-straddling and a chief cause of head-on collisions. To steer safely in traffic, you should ignore the fact that you sit left of center in the car. Simply look well ahead at the center of your lane. Aim high, keep your main attention well ahead, and always steer for the center of your intended driving path. Never move the wheels unless your eyes are looking where you want to go. This rule applies to turning a corner. Keep your main attention well ahead along your turning path. If visibility is poor and you cannot look well ahead, slow down!

2. Watch the big picture—Keep a general watch over a wide, deep traffic scene rather than on any one detail. View the car ahead as only part of a big picture. You will see the wide, deep scene, noting key parts of the picture such as the car coming in from the left, the flashing of brake lights on the car ahead, or a parked car with a driver at the wheel. When you have the habit of seeing the big picture, you can speed up, slow down or change lanes to keep from getting trapped.

3. Keep your eyes moving—Build a habit of forcing your eyes to move about once every two seconds, and much oftener when traffic multiplies. Even if there seems to be nothing important to watch at the moment, keep scanning the whole

scene near and far ahead, to the sides and through your rear view mirror. Scanning the roadway continuously gives you a wide-screen motion picture of the scene ahead, plus a continuous check on the constantly changing picture to the rear. When you see a hazard, don't stare at it. Dispose of it by adjusting speed, changing lanes, signaling—or all three if necessary.

4. Make sure they see you—To drive safely, you must get the habit of making sure the other person sees your car and shows by his action that he intends to stay put. In case of doubt, use your horn or flash your headlights at night. Give your warning as early as possible so you can stop if necessary.

5. Leave yourself an out—Get the habit of timing your pace so you always have an out if trouble develops. Watch your stopping margin, especially at night. And try to avoid being "boxed in" on both sides in traffic so you could not veer away from sudden danger. It is a good idea to leave one car space ahead for each ten miles of your speed to avoid the danger of "bumper chasing" or "tail-gating."

Another item in the second bulletin, discussing mainly intoxication in its relation to driving, is particularly significant for physicians.

How do you meet the plea of a driver accused of driving under the influence when he claims that drugs, prescribed by his physician, have produced the symptoms similar to those of intoxication? Here's one answer.

It is the responsibility of physicians to warn patients of drug reactions which might hamper driving ability. When a plea of drug influence is made, the prosecuting attorney should ask the physician whether he informed the patient of the danger of driving before the effects of the prescribed drugs had worn off. If the doctor has given such a warning the driver would have no defense, as most states prohibit driving while under the influence of self-administered drugs. *Enforcement officials might well inform doctors on the importance of such warnings.*

PRESIDENT'S PAGE

DEAR DOCTOR:

Kansas doctors should and must have a more active and more direct voice in the operation of Kansas Physicians' Service, our Blue Shield plan.

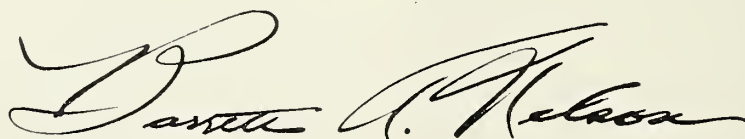
During the 12 years the plan has been in effect, there has been utterly inadequate liaison between the staff and the medical profession by whom it was conceived and continuously underwritten and sponsored. True, individual physicians such as Conrad Barnes, Henry Blake, Lloyd Reynolds, Lucien Pyle, Francis Collins and others have actively rendered great service both to Blue Shield and the profession. Twenty-three of the 29-member board of trustees are doctors of medicine. But the board meets infrequently; individual members are not as well informed as they should be; and their hurried actions are chiefly official approvals of actions of the staff and executive committee. Some board members are even bewildered as to how they were appointed and do not fully comprehend their important function as representatives of their councilor districts. Certainly there is obvious need for further and freer channels of contact between the medical profession and the Blue Shield administrative staff.

The Blue Shield Relations Committee has been formed to fill this breach. It is already activated under its able chairman, Dr. D. G. Laury of Ottawa. There is a member from each councilor district. In his district each member is chairman of the district committee, consisting of representatives from each county society. This carries the liaison directly to the constituent membership of the entire medical society.

Each county society is asked to make its appointment to the district Blue Shield, then urged to set aside a definite period of at least a few minutes at every meeting to permit its Blue Shield representative to report Blue Shield progress, Blue Shield problems, changes in fee schedules, proposed expansion, or revision of contracts, changes in policy, and other developments. Resulting discussion and expressions of opinion then furnish material for this member to carry to the Blue Shield administration through the Relations Committee. Meantime the Blue Shield staff is to keep the members of all these committees continuously and thoroughly informed so each may be fully conversant with all Blue Shield matters for transmissal to the entire profession. Of equal, possibly even greater importance, is the members' function to channel the thoughts of the profession back to Blue Shield.

It is fully expected, as a result, that Kansas Physicians' Service will more fully reflect the aims of the profession, that the practicing physician will come to realization of the tremendous service Blue Shield has provided to ward off full socialization of medicine, the great assistance it has extended to our patients to help meet the economic problems of illness, and the large part it has played in solving much of the doctor's collection problems. Not to mention the fact that the rapidly expanding medical prepayment and insurance plans are bound to approach proper and ideal form in direct proportion to the influence wielded by the non-profit, physician-sponsored, physician-controlled Blue Shield plans.

Fraternally yours,

A handwritten signature in cursive script, reading "Daniel A. Nelson". The signature is fluid and elegant, with a large initial "D" and a long, sweeping underline.

President

EDITORIAL COMMENT

Medical Care of the Indigent

Certain facts relating to the program of medical care of the indigent in Kansas are well known to many in the medical profession. On the other hand, some physicians are not at all acquainted with the facts relating to this problem. An explanation will necessarily be long in order to cover the past experience and to project toward the future.

On many occasions the Kansas State Board of Social Welfare has requested the Kansas Medical Society to accept responsibility for medical care of the indigent on an equitable state-wide basis. "Medical care" is understood to include hospital care, drugs, and physicians' services. For obvious reasons the Kansas Medical Society refused to administer or be responsible for such a program and in turn recommended that each county be responsible for its own local service.

The Legislative Council studied this problem in 1953-1954. Representatives of the medical society and of the pharmaceutical and hospital associations were invited to meet with the Legislative Council. In 1954 the Society suggested that the figure of \$6.00 be used as the amount per person per month to be budgeted for medical care of the indigent. The Legislative Council ultimately recommended an amount of \$6.50. The State Board of Social Welfare said the expenditure was \$5.04 per person per month in 1953. The figure \$6.50 was reluctantly suggested by the Legislative Council with the stipulation that it be on a trial basis. At that time actuaries believed (and proved in a test case in a county in Minnesota) that an insurance company could not handle this type of program for less than \$19 per person per month.

The Legislative Council suggested that this maximum expenditure be allowed under one of three types of programs:

1. The medical society would handle the program and distribute the money. First payments would be made to hospitals and druggists, and the remainder would then be prorated to physicians on a service basis. This is known as the insurance plan, and the maximum expenditure would be \$6.50 per person per month.

2. The county welfare director would distribute the money in the same manner as above with a \$6.00 maximum. (Fifty cents, we presume, is the cost of administration plus a penalty the local society would incur for refusing to enter into an insurance program.)

3. Each recipient of public assistance would re-

ceive the \$6.50 and would purchase his own medical care.

After the Legislative Council's recommendation was adopted, the executive office of the medical society informed the membership that \$6.50 is the maximum they can expect county welfare directors to budget for medical care.

This assumption prevailed until late in 1956, when the State Board of Social Welfare approved a contract with one county at a figure over \$7.00 per person per month. Since that time other counties have been negotiating higher figures, and at least once in the last month a county has been offered an amount more than the recommended \$6.50. For this reason it appears that there is no longer a maximum figure, and each county will negotiate its own contract at a figure agreeable to all concerned.

The governor of Kansas, first in a press conference, then in his address to the legislature in 1957, and again in a press conference this month, implied that physicians are receiving \$6.50 per person which he believed to be adequate.

During recent years the Society has repeatedly asked the State Board of Social Welfare for a breakdown of medical care costs in each county. The answer from welfare administrators is that this is impossible. If this information could be made available, it would be much easier to make an evaluation of present programs and prove that physicians actually receive only a small percentage of the \$6.50 amount. The medical society can, of course, break down the costs in some 20 counties which have insurance programs.

One must presume that the situation which prompted the action of the governor was the passage in 1956 of the amendments of the Social Security Act, authorizing a new method of federal participation in state medical aid for recipients of public assistance. The amendment authorized the federal government to subsidize each state on a matching basis in the amount of \$3.00 per adult and \$1.50 per child on the relief roll. The actual formula is more complicated than this, but this is essentially correct. This subject will be discussed in detail later in the editorial.

Here is a brief picture and analysis of expenditures for medical care in certain counties in Kansas in 1956. These figures were taken directly from records of the State Board of Social Welfare.

There are 14 counties in Kansas which have 1,000 or more persons on relief rolls. Indigents in these 14 counties constitute one-half the entire indigent population in Kansas. Listed below are the counties, their indigent populations, and the amounts spent per person per month in the calendar year 1956:

| <i>County</i> | <i>Indigent population</i> | <i>Amount per person per month</i> |
|---------------|----------------------------|------------------------------------|
| Allen | 1,155 | \$6.20 |
| Atchison | 1,000 | 6.56 |
| Bourbon | 1,254 | 6.57 |
| Butler | 1,013 | 4.56 |
| Cherokee | 2,666 | 6.82 |
| Cowley | 1,244 | 4.86 |
| Crawford | 2,839 | 5.91 |
| Labette | 1,895 | 6.16 |
| Leavenworth | 1,159 | 5.85 |
| Montgomery | 2,473 | 6.48 |
| Reno | 1,580 | 3.44 |
| Sedgwick | 7,110 | 7.08 |
| Shawnee | 2,747 | 5.12 |
| Wyandotte | 4,480 | 5.86 |

One can make several deductions from the above. Sedgwick and Cherokee Counties have the highest expenditures. Cherokee exceeded the \$6.50 per month by \$0.32, while Sedgwick exceeded the recommended figure by \$0.58 per person per month. The significant fact is that neither the State Board of Social Welfare nor the governor has shown concern over the situation in Sedgwick County, but they are determined that the Cherokee County situation needs alteration because of the high cost of care.

Here is a comparison of the two counties:

Sedgwick County spends about \$600,000 per year on medical care of the indigent. Of this amount, less than 6 per cent of the total budget is paid to physicians. In other words, physicians in Sedgwick (this includes physicians employed by the county hospital) receive about 40 cents per person per month for their services and the remaining 94 per cent goes for hospitalization and drugs. The amount paid to physicians other than county hospital employees in Sedgwick County is about 2 per cent of the \$7.14, or about 14 cents per person per month. Incidentally, more than 135 Sedgwick County physicians actively participate in this program. Indigents in Sedgwick County constitute more than 2 per cent of the population.

Cherokee County, on the other hand, spends about \$300,000 each year on indigent care, indigents representing about 10 per cent of the county population. The method of distributing funds differs from that in Sedgwick County. In 1956 physicians received about 45 per cent of the total budget, hospitals 32 per cent, and pharmacists 23 per cent. Regardless of what constitutes equal distribution, the fact is that Cherokee County spends less per person than does Sedgwick. The governor's concern, apparently, refers to the amount or percentage paid to the physician rather than to the total amount spent. Incidentally, in Cherokee County about 20 per cent of the total

spent on physicians' fees in 1956 was paid to practitioners other than medical doctors.

In counties with fewer than 1,000 persons on relief rolls, expenditures in 1956 varied from \$2.97 per person per month in one county to \$35.77 in another.

Without investigating the \$35.77 per person, one can only guess at the reasons for this high expenditure. This happened in a county with only 17 persons on the relief roll. There is only one doctor in the county and he is not a member of the medical society, nor has he applied for membership after practicing in the county more than two years. In fairness to all concerned, however, it should be pointed out that with such a limited number of persons involved the insurance principle cannot work. Obviously one or two long-term hospitalization illnesses could show a high expenditure per person in a sparsely populated county without excessive fees on the part of the physician.

One other example of high cost care is found in a county which spent \$21.57 per person. There are 77 people on relief there. The only physicians in the county are located in the northeast corner, which means that one house call could constitute a trip of 70 miles. This not only points out that the cost of medical care in one county could be substantially higher than in another but indicates why the Society feels that local situations warrant local solutions.

The over-all cost of medical care of the indigent in 1956 was \$6.49, according to figures in the office of the Kansas State Board of Social Welfare. This, of course, is within the figure recommended by the Legislative Council in 1954, even after considerable increase in the cost of hospitalization and drugs.

It seems necessary to mention this fact which can be unchallenged. Regardless of where the ceiling is placed on the cost of medical care of the indigent, whether it be \$6.50 per month or \$7.50 per month, the physician is not going to receive anywhere near his regular fee, nor should he expect to. If, under an insurance program, the ceiling is fixed without regard to the cost of living, the physician will, at the outset of the program, receive more than he will get the next month, or certainly a year later. This is because of the rise in costs in hospitals and drugs which, under an insurance contract, are paid for before physicians prorate their charges for services. The only obvious solution, if the insurance plan is the feasible one, is to set the maximum figure with an annual or semi-annual adjustment based on fluctuations in the cost of living.

Just what the governor had in mind when he criticized the medical profession late in 1956 and twice again in 1957 is difficult to analyze. In the

first place, the cost of medical care, according to the latest figures available, fell below \$6.50, the figure approved by the Legislative Council and now suggested by the governor. It is surprising for a governor to be critical of a governmental agency which lives within its budget, let alone a group of private citizens volunteering their services at a substantially (75 per cent) reduced cost.

One could not leave this subject without a look at the immediate past and certainly the future of this program. The most important consideration at present is the federal government.

Although the federal government, as of October 1, 1957, gave a substantial increase to the over-all cost of state welfare programs in accordance with a formula set forth by Congress, this discussion will deal only with the part of the 1956 Social Security amendments which authorized a new financing method for medical care of the indigent. As previously mentioned, this amounts to about \$3.00 per person per month for adults and \$1.50 for each child. This amount alone will make a substantial increase in the 1958 welfare budget. The exact amount cannot be ascertained from the State Board of Social Welfare, but this information is forthcoming from Washington.

If one outside the welfare office would try to arrive at the increased figure, he would have difficulty because the formula is complicated. For example, this medical program applies only to persons in four categories of assistance, but these four include more than 90 per cent of those on relief. Counties must meet certain requirements to participate in this program.

The federal government was asked if a county could participate in the matching program if a county physician handled all its welfare work. The first answer was "yes." Then it became "no." When that was challenged it was changed to "yes" again, and today the answer is "I don't know." This is just an example of why it is difficult to make a statement in regard to the amount of federal aid which will be expended in Kansas in 1958.

Nevertheless, it is a known fact that Kansas will receive a substantial amount under the new medical plan and the increased aid in over-all assistance to the state. A conservative estimate, reluctantly made at this point, would be in the neighborhood of three million dollars for the two programs.

It has been mentioned that the Kansas legislature will be asked to appropriate approximately \$12 million in January, 1958 to cover an estimated deficit in all state expenditures. Is the governor attempting to take care of part of this deficit by using federal funds earmarked for medical care for other purposes?

Is the governor like the parent who tells a child he is spending too much money, even though the child is living within his allowance, or like the employer who tells his employees he is looking for ways to decrease expenditures even though it can't be done? Naturally the psychological factor is in favor of the parent or employer in that it is an instrument used to keep the allowance or expenditures within the framework of the budget whether practical or not.

Members of the medical society should be aware of the following:

1. The Legislative Council in 1954 did recommend a \$6.50 per person maximum expenditure on a trial basis.

2. Since 1954, in a typical county using the insurance plan, the cost of hospitalization has risen about 10 per cent, the cost of drugs about 3 per cent.

3. This increased cost decreases the amount received by physicians since hospital and drug charges are paid before physician fees.

4. The federal government, regardless of what one may think, has in the 1956 Social Security amendments earmarked a substantial increase to the states for medical care.

5. The growing tendency on the part of politicians is to exploit the doctor unfairly, charging or implying that the physician now receives the \$6.50 when in fact he receives less than one-fourth of this amount.

6. If the governor is successful in holding the line to a \$6.50 maximum, the earmarked medical care money from the federal government will be forthcoming and will be used to help pay the state deficit or for additional state-supported programs.

Does the Kansas Medical Society wish to take immediate action upon one of the following:

1. Recommend that the maximum figure remain at \$6.50.

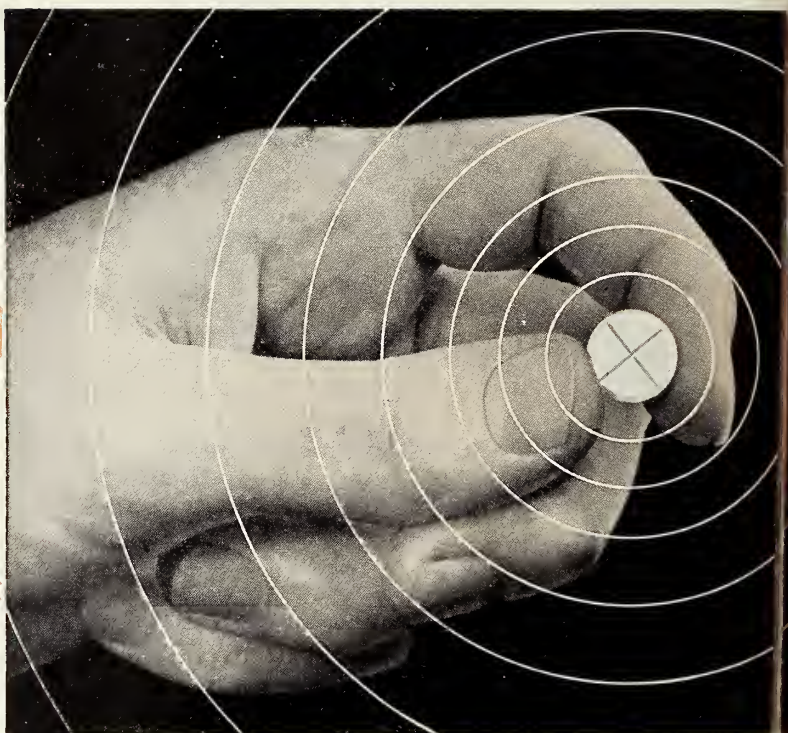
2. Recommend that the figure remain at \$6.50 plus increased costs of operating such programs since 1954.

3. Serve notice that physicians will cooperate in a program only if a specified amount or percentage of the total is budgeted for physicians. In that way, in the future, no one will think of the doctor's income in terms of over-all medical care which includes hospitals and drugs.

4. Present a fee schedule upon which all physicians in Kansas can agree.

In the interest of public relations, the Society must be firm in its stand on this issue. Regardless of the course, the future program must be clear so that no public figure can criticize a profession which contributes a great amount of time in the interest of public service. Certainly the public is entitled to a

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The recommended adult dose is 1 Gm. (2 tablets or 4 teaspoonfuls of syrup) the first day, followed by 0.5 Gm. (1 tablet or 2 teaspoonfuls of syrup) every day thereafter, or 1 Gm. every other day for mild to moderate infections. In severe infections where prompt, high blood levels are indicated, the initial dose should be 2 Gm. followed by 0.5 Gm. every 24 hours. Dosage in children, according to weight; i.e., a 40 lb. child should receive $\frac{1}{4}$ of the adult dosage. It is recommended that these dosages not be exceeded.

Tablets:

Each tablet contains 0.5 Gm. ($7\frac{1}{2}$ grains) of sulfamethoxy-pyridazine. Bottles of 24 and 100 tablets.

Syrup:

Each teaspoonful (5 cc.) of caramel-flavored syrup contains 250 mg. of sulfamethoxypyridazine. Bottle of 4 fl. oz.

¹ Nichols, R. L. and Finland, M.: J. Clin. Med. 49:410, 1957.

breakdown of medical care costs for which they pay. The medical society at this time or in the future is happy to make known the percentage or amount of the total medical care budget which is used for physicians' services.

Public Relations A Plus

The Medical Society of Sedgwick County has once again proved that a lot of effort with little expense can improve immeasurably the attitude of the people toward the profession.

Business Education Day was observed in Wichita on October 24. This is a day set aside for teachers to visit various businesses and organizations in the locality for the purpose of achieving a better understanding and knowledge of their city.

Seventy-five of the 2,500 Wichita teachers were guests of the medical society. During the morning they were introduced to their hostesses, members of the Woman's Auxiliary. Five teachers were assigned to each hostess. The remainder of the morning was spent in touring the offices of doctors practicing various specialties. At each stop on the tour, a physician explained his office routine and gave a brief description of various types of medical care. This part of the day gave the teachers a realistic picture of medical problems and was mentioned enthusiastically by all who participated.

Following a luncheon at the society office building, the teachers heard a résumé of the purposes and activities of the medical society, presented by the executive secretary in Sedgwick County, Mr. H. Martin Baker. Officers and committee chairmen currently serving the society were also present.

After a tour of the society building, the 75 teachers divided into three groups, each going to a different hospital for indoctrination there. At each hospital a pathologist conducted a tour and gave explanations of various hospital customs, resources, and facilities. The day ended with a trip through the new county hospital for indigent patients.

An educational program of this type can be a project of any county society in the state and would pay dividends in better understanding on the part of all who are thus indoctrinated.

Eight Americans died from rabies in 1956, according to a study reported recently by the American Medical Association. One additional death was attributed to rabies but was not confirmed by autopsy. Five of the confirmed deaths occurred in Texas and one each in Alabama, Indiana, and New Mexico. In recent years the lowest death rate was 4 in 1955; the highest was 24 in 1952.

DEATH NOTICES

JAMES HARVEY McNAUGHTON, M.D.

Dr. J. H. McNaughton, 77, who practiced in Topeka for many years before his retirement, died at a Topeka hospital on September 25. He was graduated from Kansas Medical College in 1902 and began practice immediately. After many years as an active member of the Shawnee County Medical Society, he became an honorary member of that group and held that status at the time of his death.

BENJAMIN BRUNNER, JR., M.D.

Death came unexpectedly to Dr. Benjamin Brunner, Jr., 45-year-old Wamego physician, the apparent victim of a heart attack, on September 29. A graduate of the University of Kansas School of Medicine in 1936, Dr. Brunner began practice in Wamego with his father, the late Dr. Benjamin Brunner, Sr. He was an active member of the Pottawatomie County Medical Society.

ENOCH SCHUMANN, M.D.

Injuries received in an automobile accident on September 20 proved fatal on September 27 to Dr. Enoch Schumann of Blue Rapids, who died at a Concordia hospital. The 76-year-old physician had completed 50 years in practice earlier this year. A graduate of Ensworth Medical College, St. Joseph, in 1907, Dr. Schumann did postgraduate work for two years at Rush Medical College, Chicago. His first Kansas work was in Cleburne, from where he moved to Blue Rapids in 1919.

LYMAN C. MURPHY, M.D.

A Wichita pathologist, Dr. L. C. Murphy, 75, died at his home on October 4. He was graduated from St. Louis University School of Medicine in 1921 and came to Kansas from Chicago in 1937. He had served as pathologist for Sedgwick County Hospital and for several outlying hospitals until his semi-retirement in 1944. He was a diplomate of the American Board of Pathology.

THE MONTH IN WASHINGTON

Several months in advance of the return of the 85th Congress for its election-year second session, influential figures in the field of health in both the executive branch and in Congress were being heard on what 1958 has in store for the medical profession.

Because of the roles they play in the Capital, their views are worth more than passing notice. One is the chairman of the important health appropriations subcommittee of the House, Rep. John Fogarty (D., R.I.). He used as a forum for his prophecies the annual convention of the American Hospital Association.

Other prognostications came from Dr. Aims C. McGuinness, special assistant for health and medical affairs to Secretary Folsom of the Department of Health, Education, and Welfare. Dr. McGuinness spoke out at a dedication ceremony of a new chronic disease and rehabilitation facility in Maine.

Mr. Fogarty places at the top of his predictions some action on federal construction aid to medical schools. The Rhode Island Democrat has his own bill on the subject, although there are others pending. Comments Mr. Fogarty: "... the shortage of health education facilities today is probably the most serious bottleneck in our whole medical system. . . . These schools . . . fall far short of accommodating the fully qualified and competent young men and women in America who are anxious to train and qualify in medical, dental and public health fields."

The record of the past several years has shown that no member of the House is listened to more carefully when it comes to health than Mr. Fogarty. His philosophy in the health field is worth noting: "It is now generally accepted that the health of our people is a major national resource and that the government, therefore, has a direct responsibility for the health of everyone."

Dr. McGuinness also spoke out strongly for federal aid to medical schools. Failure to meet the needs of the schools, he told his audience, would be "the worst kind of economy." He feels that the administration proposal for \$225 million in construction grants would bring classrooms and research laboratories "much closer to current and projected needs."

While neither man had any specific legislative proposals to make in the field, both foresee a growing role for hospitals in the practice of medicine. Dr. McGuinness put it this way: "General hospitals must broaden their services and achieve greater co-

ordination. The term 'hospital care' should include not only bed care but diagnostic service as well as service to ambulatory patients."

Mr. Fogarty, looking ahead 25 years, said it was safe to predict that virtually every general hospital in the nation will be providing at least as much preventive service as curative service. "You are, in fact, moving closer each moment to the day when hospitals will be the focal point of health services for all of us, throughout our entire lives."

The same day that Mr. Fogarty was urging the hospitals to use the basic Hill-Burton hospital construction program to meet future health needs, the AHA House of Delegates approved a set of legislative proposals to present to the next session.

They would accomplish the following: (1) extend the act for five years beyond June, 1959, (2) authorize matching Hill-Burton funds for renovation and repairs of hospital plants, (3) set up loan authority so that hospitals not desiring grant money could borrow construction and renovation funds at very low interest rates (from 1½ to 2 per cent). The house also urged a grants program to hospitals with nursing schools and to other nurse institutions for professional education, exclusive of construction grants.

Notes

One committee of Congress knows months in advance just exactly what it plans to do the day Congress reconvenes. The tax-writing House Ways and Means Committee has set hearings starting January 7 on possible tax reductions next year.

Included on the agenda will be testimony from various organizations on the Jenkins-Keogh bills for allowing tax deferments for money paid into retirement plans. The American Thrift Assembly, which is backed by the American Medical Association and other professional and business groups, plans to be heard at some time during the 30 days of hearings.

Veterans Administrator Harvey Higley believes that the public is losing interest in the veteran and his problems, and that some doctors no longer hesitate to attack medical care for veterans, particularly those with non-service-connected disabilities. Mr. Higley spoke at the annual American Legion convention.

Health directors of 21 American republics, holding their annual Pan-American Sanitary Organization meeting here this fall, voted a \$3 million budget for the Pan-American Sanitary Bureau's 160-odd health projects for next year.

Clinicopathological Conference

Diabetes Mellitus, Hyperlipemia and Recurrent Acute Pancreatitis

Case Presentation

We are discussing today a 27-year-old, white housewife who was admitted to this hospital for the first time on April 18, 1953, complaining of diabetes and a skin rash of six months duration. She was admitted for the second time on September 14, 1956, and died the following day.

In 1951 she first became aware of several small, hard, reddish papules with yellow centers which appeared on the extensor surfaces of her forearms, hands, and legs. She consulted her physician who prescribed a brown liquid. After she took this medication for one month, the papules disappeared and did not reappear until six months before her admission. At that time she noticed similar lesions on her hands; these spread to involve the arms, legs, and back. The nodules were not painful, and there was no associated pruritus, but pressure on them produced a sharp stabbing pain. The patient came to the outpatient clinic at this hospital for evaluation of the skin rash.

She stated that she had been overweight all of her life, her maximum weight being 245 pounds in March, 1953. Since that time, although she had noted an increase in appetite associated with a craving for sweets and pastries, she had lost 31 pounds. During March, 1953, she suffered from increasing fatigue, and during the three weeks before admission she experienced unusual thirst, frequency of urination, and nocturia. Since August, 1953 she had had intermittent perineal pruritus and dysuria, usually preceding the menses. There had been no disturbances of vision, no paresthesias, no numbness or disturbances of gait. She had had no chills, sweats, or fever. Her gums bled easily, and infections were slow to heal. She had had one or two colds a winter, but no sore throat or hoarseness, and there was no dyspnea, cough, hemoptysis, chest pain, palpitation, or other cardiorespiratory symptoms. Minimal ankle edema had occurred on prolonged standing.

She had no unusual food intolerances, nausea or vomiting, and no abdominal pain; bowel movements

had been normal. Her menarche was at 13 years of age, and she had 28- to 31-day cycles with a four- to five-day menstrual flow. There had been one episode of intermenstrual spotting in March, 1953. She complained of a watery, white, vaginal discharge of approximately six weeks duration. She had never been pregnant. On April 1, 1953, she had low lumbar back pain radiating down the right posterior thigh to the toes. The pain was not incapacitating and was relieved by lying flat on her back.

She had had the usual childhood diseases without sequelae. In 1949 she had had pneumonia which was treated with penicillin. There had been no other serious illnesses, accidents, or operations. She had never had scarlet fever, rheumatic fever, tuberculosis, asthma, or renal diseases. She did not use tobacco or alcohol.

The patient's mother was 41 years of age, living and well; her father died of pneumonia in 1941. There were four sisters, living and well. There was no family history of diabetes, hypertension, kidney disease, cancer, allergy, tuberculosis, or arthritis.

On physical examination the patient was found to be an obese, young, white woman in no apparent distress. Her blood pressure was 135/100; pulse, 108; respiration, 24. There were numerous elevated, irregular, reddish papules with firm, yellow centers involving the skin of the extensor surfaces of the forearms, posterior aspects of the thighs, and the back. One papule was seen on the hard palate. Her thyroid was not enlarged, and no cervical adenopathy was present. The chest was clear to auscultation and percussion; the heart was not enlarged, and there were no thrills or murmurs. The extremities were not unusual; there was no edema; peripheral pulses were palpable and equal. The deep tendon reflexes were normal, and no pathological reflexes were present.

The urine had a specific gravity of 1.027; albumin, 3 plus; sugar, 2.2 per cent; rare granular casts; many bacteria; and 8 to 10 pus cells per high power field with an occasional red cell and some pus clumps. The red count was 5,280,000 with 15.2 gm. hemoglobin, and the white count was 10,600 with 60 per cent polymorphonuclears; 31 per cent lymphocytes; 2 per cent eosinophiles; and 7 per cent monocytes. The platelet count was 250,000 per cu. mm. The VDRL was non-reactive. Serum calcium

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

was 5.5 mEq/L; sodium, 118 mEq; potassium, 4 mEq; carbon dioxide, 19.5 mEq; chlorides, 87 mEq; phosphorous, 1.9 mEq; non-protein nitrogen, 39 mg. per cent; creatinine, 1.5 mg. per cent; blood sugar, 260 mg. per cent; and cholesterol, 1675 mg. per cent with 65 per cent esters. The serum albumin was 3.06 gm. per cent; globulin, 4.24 gm. per cent. The prothrombin time was 100 per cent of normal. The thymol turbidity was 30 units. The two-hour urobilinogen excretion was 1.35 mg. Phenolsulphonthal-ein excretion was 69.5 per cent; urea clearance, 85 ml. per minute. A Coombs' test was negative.

All skin tests were negative. The I^{131} uptake by the thyroid was 17 per cent in 24 hours; basal metabolic rate, plus 25. There was persistent albuminuria, and quantitative albumin excretion ranged from 110 to 210 mg. per day. The specific gravity of the urine ranged between 1.002 and 1.016.

After she was placed on adequate insulin therapy the glycosuria disappeared, but there was persistent pyuria with an occasional cast and red cells. Serum electrolytes were restudied, and on April 23, 1953, the sodium was 127 mEq/L; potassium, 4.5 mEq; chlorides, 89 mEq. On May 4 the sodium was 131 mEq; potassium, 4.4 mEq; and chlorides, 100 mEq. There was a gradual decrease in cholesterol values to 496 mg. per cent at the time of discharge. The urine culture revealed a few colonies of non-hemolytic *Micrococcus aureus* and enterococci. The sedimentation rate was 25 mm. in one hour.

The patient's temperature was 99.6 degrees on April 18, but during the remainder of her hospitalization she was afebrile. She weighed 211 pounds on admission. From April 18 to April 20 she received no insulin and had persistent glycosuria. On April 22 she was started on 15 units of isophane (NPH) insulin, and during succeeding days this was gradually increased to 35 units a day at the time of discharge. The glycosuria disappeared except for an occasional trace on April 23, at which time she was taking 15 units of isophane insulin. The blood sugars gradually decreased during the last few days and ranged between 195 to 110 mg. per cent.

She felt well throughout her hospitalization. She was instructed in the use of insulin and placed on a diet of 130 gm. carbohydrate, 80 gm. protein and 60 gm. fat. On this regimen the skin lesions gradually disappeared, and she was discharged on the diabetic diet and 30 units of isophane insulin.

She was admitted for the second time on September 14, 1956, complaining of epigastric pain, nausea, and vomiting. She had had a sudden onset of acute abdominal pain with nausea and vomiting about 36 hours before coming to the hospital and

had taken little by mouth during this period. The vomitus was bile stained. She said that she had had a similar episode in September, 1955, but that it had responded to conservative measures. She had taken her insulin the day before and the day of admission.

She was an extremely obese, acutely ill woman complaining bitterly of epigastric pain. The blood pressure was 120/80; pulse, 120 and regular; temperature, 100.6 degrees. The pupils were round and equal and reacted to light and accommodation. The fundoscopic examination was unsatisfactory. The tongue and mucous membranes were dry and coated. No acetone breath was noted. The chest was clear to auscultation and percussion; there were no heart murmurs. The liver was felt 9 cm. below the costal margin; the edge was sharp and exquisitely tender. There was diffuse, rebound tenderness in the epigastrium. No bowel sounds could be heard. There was questionable cyanosis of the fingers. The deep tendon reflexes were physiologic; the cranial nerves were intact; no pathological reflexes were noted.

She was admitted on the surgical service on the advice of her personal physician. Five hundred ml. of Dextran was given intravenously, followed by 1000 ml. of dextrose (5 per cent) in saline. She was then transferred to the medical service. For six hours after admission she complained of excessive thirst and severe abdominal pain, and she continued to be nauseated, vomiting "coffee-ground" material intermittently. At 7:30 p.m. she became extremely disoriented, combative and confused, and she was given 200 ml. of dextrose (5 per cent) in saline with 25 units of regular insulin. This was followed with 1000 ml. of 1/6 molar sodium lactate with 500 mg. of tetracycline added. At 8:30 p.m. she was given 50 units of regular insulin subcutaneously because the urine sugar had been 4 plus with 3 to 4 plus urine acetone. At 10:00 p.m. the urine sugar was still 4 plus, and she was given another 50 units of insulin.

At 9:30 p.m. she became hypotensive and was given a second 500 ml. of Dextran rapidly. The foot of the bed was elevated, which temporarily returned the blood pressure to normal. During the next five hours she was intermittently hypotensive but responded to elevation of the foot of the bed. At 10:30 p.m. a gastric tube was passed with much difficulty and "coffee-ground" material was aspirated. She pulled the tube out, and although it was replaced twice, she pulled it out each time. She was given 50 units of insulin at 11:15 p.m. and 40 units at 12:30 a.m. (September 15, 1956). At 11:30 p.m., 120 mg. of amobarbital sodium was given intramuscularly in an attempt to reduce her agitation.

At 2:00 a.m. she rested quietly, did not complain of abdominal pain, apparently felt better, and was more alert than she had been at any time since the original examination.

At 2:15 a.m. she suddenly stopped breathing, became cyanotic, and died. There were no convulsive movements, and the heart was heard for approximately 50 to 60 seconds following cessation of respirations.

Dr. Mahlon Delp (moderator): Are there any questions for Dr. Manning?

Howard E. Gard (fourth year medical student)*: Did she have epigastric pain before her admission?

Dr. Robert Manning (resident in medicine): There was no history of any pain.

Wayne Frazier (fourth year medical student): When was the diagnosis of diabetes first made?

Dr. Manning: About six months before she was seen here.

Mr. Frazier: What was the serum amylase?

Dr. Manning: On the last admission the serum amylase was between 100 and 150 mg. per cent.

Ralph R. Hall (fourth year medical student): What was the cholesterol level on the first admission, and how rapidly did it decrease?

Dr. Manning: On April 22, 1957, it was 1675 mg. per cent; on April 24, 1220 mg. per cent; on April 29, 780 mg. per cent; on May 1, 627 mg. per cent; and at discharge, 496 mg. per cent.

Mr. Gard: Were any flapping tremors noted?

Dr. Manning: There were tremors at one time.

Dean Gettler (fourth year medical student): Did she take insulin between the periods of hospitalization?

Dr. Manning: Her husband said that she did.

Mr. Gard: What was the last blood sugar in the terminal episode?

Dr. Manning: 270 mg. per cent.

Carlyle M. Dunshee (fourth year medical student): What was the blood pressure in the final episode?

Dr. Manning: Her blood pressure, except for a brief period of hypotension, fluctuated from 110 to 120 systolic and 70 to 80 diastolic.

Mr. Gettler: What was her urinary output?

Dr. Manning: It was usually 50 to 100 ml. per hour.

Mr. Frazier: Was her spleen ever enlarged?

Dr. Manning: No.

Dr. John F. Christianson (internist): Was anyone in the room when she suddenly stopped breathing?

Dr. Manning: Dr. Daugherty was there. She had stopped breathing and was cyanotic. She gasped once or twice.

Robert F. Goodwin (fourth year medical student): What was her temperature on admission?

Dr. Delp: It was 100.6 degrees.

Mr. Frazier: Did the papules on her arm become pustular?

Dr. Manning: I do not know.

Dr. Delp: I do not believe they were pustular; they were chamois-colored papules.

Mr. Hall: Was a serum calcium determination made during the terminal episode?

Dr. Manning: An attempt was made, but we had insufficient serum.

Dr. Delp: May we have the electrocardiogram, please?

Mr. Hall: This tracing, made on the first admission (Figure 1) shows a regular sinus rhythm. The rate is 120. There is inversion of the T-wave in lead III and flattening of the T-wave in the last three chest leads. The Q-T interval is approximately 0.3, which is within the upper limits of normal for this heart rate. I think this electrocardiogram is compatible with myocardial ischemia.

Dr. Delp: Dr. Lin, do you have any comments?

Dr. T. K. Lin (cardiologist): The T-wave is difficult to interpret.

Dr. Delp: May we have the x-rays, please?

Mr. Gettler: The first x-ray is a P-A and lateral of the skull in which I see deviation of the nasal septum, but no other bony abnormality. In the lateral I see no bony abnormalities, and the appearance of the skull is normal. In the P-A and lateral film of the chest there are no bony abnormalities; the costophrenic angles are clear. The hilar markings are normal, and the lung fields are clear. The heart is not enlarged.

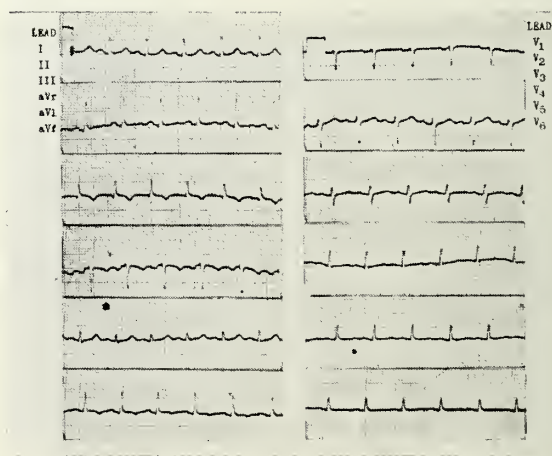


Figure 1. Electrocardiogram, first admission.

* Though a medical student in May, 1957 when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1957.

Dr. Delp: Dr. Tice, do you have any comments?

Dr. Galen Tice (radiologist): I have nothing to add.

Dr. Delp: This is an interesting case with some facets that are highlighted distinctly. Mr. Frazier, may we have your discussion, please?

Differential Diagnosis

Mr. Frazier: The case for discussion today concerns an obese, 27-year-old white woman who first entered this hospital on April 18, 1953, with a chief complaint of a skin rash for six months and diabetes. She had first noted multiple small, hard, reddish papules with yellow centers on the extensor surfaces of her forearms, hands, and legs. These papules disappeared after she took a brown medicine for one month. The lesions recurred about six months before the first admission, and she came to the outpatient clinic to have them evaluated. She had always been obese, but she had lost more than 30 pounds in the two months before admission. Other symptoms included increased appetite, fatigability, thirst, urinary frequency, and nocturia. She had a history of perineal pruritus, burning on urination, and slow healing of infections.

The physical examination at the time of the first admission revealed an obese female in no acute distress. The skin lesions were present on the extensor surface of the forearms, the posterior aspects of the thighs, the back, and the hard palate. Positive urinary findings included albuminuria, glycosuria, bacteriuria, pyuria, and granular casts. Other findings were: blood sugar, 260 mg. per cent; sodium, 118 mEq/L; carbon dioxide, 19.5 mEq; thymol turbidity, 30 units; reversed albumin:globulin ratio, and a serum globulin of 4.24 gm. per cent.

During the hospital course she continued to have pyuria with occasional casts, red blood cells, and albuminuria. Sodium and chloride determinations showed a return toward normal values on repeat studies. The cholesterol value gradually decreased to 496 mg. per cent at the time of discharge.

On the fourth hospital day she was started on insulin which was gradually increased to 35 units of isophane insulin daily. The glycosuria disappeared; the blood sugar decreased; the skin lesions began to disappear. She was discharged on May 6, 1953, on a diabetic diet and 30 units isophane insulin daily.

She reentered this hospital for the second time more than three years later. She had been experiencing acute epigastric pain with nausea and vomiting for 36 hours. A similar episode had occurred a year previously. Physical examination revealed an acutely ill obese woman with a pulse rate of 120 and a temperature of 100.6 degrees. Her tongue and mu-

cous membranes were dry and coated. The liver was enlarged and quite tender. There was rebound tenderness, and bowel sounds were absent.

Laboratory findings include pyuria, glycosuria, albuminuria, casts, and acetonuria. The red count was 5,959,000 with 17.5 gm. of hemoglobin. The blood sugar was 696 mg. per cent; sodium, 114 mEq/L; carbon dioxide, 14.4 mEq; chlorides, 66 mEq; BUN, 28.5 mg. per cent. Repeat electrolytes showed sodium, 130 mEq; chlorides, 90 mEq; potassium, 4.5 mEq.

During the first hours after her admission she had excessive thirst, severe abdominal pain, nausea and vomiting of coffee-ground material. Therapy included intravenous Dextran, 5 per cent glucose in saline, 1/6 molar sodium lactate, tetracycline, and regular insulin.

On the evening of admission she had intermittent hypotension which responded to elevation of the foot of her bed. She was disoriented and confused, and was given amobarbital sodium to relieve the agitation. The blood sugar had decreased to 170 mg. per cent by 12 o'clock. By 2:00 a.m. she was quiet, and apparently felt better. At 2:15 a.m. she suddenly ceased breathing, although heart tones persisted for about one minute.

The findings in this case present the classical picture of diabetes mellitus. The question is whether diabetes, per se, can explain the various unusual facets of this case. The description of the skin lesions points to typical xanthomata, and I shall base my differential diagnosis on those diseases which are characterized by xanthomata.

The first group of such diseases I would like to mention is that called the hypercholesterolemic xanthomatoses, including (1) familial hyperlipemic xanthomatosis; (2) those secondary to liver diseases such as biliary cirrhosis, hemochromatosis, and post-operative obstruction of the bile duct; and (3) hypercholesterolemia in hypothyroidism. These diseases can be ruled out because, in them, the serum is never chylous in appearance, as it was seen in this case.

Another group of such diseases, classified as normocholesterolemic xanthomatoses, includes eosinophilic granuloma and Hand-Schüller-Christian disease. I rule these out because, in them, the serum is characteristically clear, and the cholesterol is normal. This patient had high cholesterol levels and milky serum.

The third group is the hyperlipemias which are associated with secondary eruptive xanthomata. Idiopathic hyperlipemia may be classified as infantile or adult. The latter is characterized by skin eruptions, milky serum, retinitis, hyperlipemia (correctable by diet) and glycosuria (corrected by diet). Hepatosple-

nomegaly and abdominal pain may be present. Although this disease explains many of the findings in our patient, I rule it out because insulin was ineffective in reducing the hyperlipemia. In our patient the lesions preceded the diabetes.

Hyperlipemia with xanthomata can occur in glycogen storage disease, but I rule this out because it occurs mainly in children. I also rule out lipoid nephrosis as a cause of hyperlipemia because there is no evidence of anasarca in our patient.

Hyperlipemia can occur in chronic pancreatitis and give rise to skin lesions such as our patient had. Pancreatitis commonly causes abdominal pain, glycosuria, and hepatosplenomegaly. This could explain the patient's diabetes and many of the other findings. It is a diagnosis difficult to rule out. I do so, however, because there was no history of the usual repeated attacks of abdominal pain, because of failure of the hyperlipemia to respond to insulin, and because of lack of positive laboratory findings.

Hyperlipemia with secondary xanthomata is seen in severe untreated diabetes, the well known xanthoma diabetorum. There are the usual findings of diabetes, abdominal pain, and liver enlargement. The hyperlipemia is reduced by insulin.

I believe that the findings in our patient can be explained upon the single disease of diabetes mellitus. An underlying pyelonephritis may have caused the difficulty in controlling the diabetes. The patient had diabetic acidosis which apparently responded satisfactorily to treatment.

The sudden death is difficult to explain. The usual cause of sudden death in diabetes is coronary artery or renal disease, but that seems unlikely here. One must consider a cerebral vascular accident with the secondary polycythemia atherosclerosis and hypotension as antecedent factors. With no real basis to explain the phenomena, however, the terminal episode is only a speculation. The patient's death may actually have been unrelated to the underlying disease.

Clinical Discussion

Dr. Delp: Mr. Hall, how do you account for the low serum electrolyte values?

Mr. Hall: The explanation which seems most satisfactory is that offered by Albrink.¹ In studying a diabetic patient having very high blood lipid levels, xanthoma diabetorum, and lactescent serum, she found serum electrolyte values even lower than these. Removal of the insoluble lipids by ultra centrifugation from the serum left the electrolyte levels quite normal.

On this patient's final admission many explanations may have been offered for the low electrolyte concentrations, but this was not so for the first ad-

mission, at which time this unusual finding apparently aroused no curiosity.

Dr. Delp: What were your ideas about this patient when you first saw her, Dr. Weber?

Dr. Robert Weber (internist): This patient was referred here with a diagnosis of acute cholecystitis. She was admitted to the surgical service, because it was thought that she had an acute abdomen. When the initial laboratory results were obtained she was transferred to the medical service. Although the high blood sugar and low carbon dioxide values suggested diabetic acidosis, it was not believed that this explained the entire picture.

It is most unusual for an obese diabetic to have uncomplicated diabetic acidosis. These patients almost never develop acidosis unless some primary disease such as an infection or a vascular accident precipitates it. I believed that this patient had peritonitis because of absent bowel sounds and an acutely tender abdomen. My first impression was that she had a perforated gallbladder or duodenal ulcer, and acute pancreatitis was strongly considered. The hypotension which she developed was probably the most important clue. She improved temporarily following intravenous fluids, insulin, and gastric suction, but surgical intervention was not considered advisable because of her hypotension and extreme obesity.

Dr. Delp: You saw this patient soon after her final admission, Dr. Manning. What did you think caused her pain?

Dr. Manning: The appearance of acidosis in an obese diabetic makes mandatory a search for a severe precipitating factor. When I first saw this patient, I thought that the pain was probably due to acute fatty infiltration of the liver, and that the acidosis had been precipitated by acute cholecystitis. The subsequent course made this seem unlikely, and I then favored the diagnosis of acute pancreatitis.

Dr. Delp: Dr. Allbritten, may we have your comments?

Dr. Frank Allbritten (surgeon): The differential diagnosis, considering the overwhelming pain which the patient had, lies between the perforation of a viscus resulting in a generalized peritonitis and acute pancreatitis. Initially, acute pancreatitis gives retroperitoneal inflammation. With the extension of the disease, generalized peritonitis may occur. Following perforation of a lesion of the gastrointestinal tract there are the signs of peritonitis immediately.

The signs of generalized peritonitis occurred late in the course of the disease of this patient and could easily have been secondary to acute pancreatitis. Interestingly enough, the electrolyte changes suggest that she had lost considerable fluid from the circulating blood volume, either into the peritoneal

space or retroperitoneally. They also suggest that there had been extensive tissue destruction. The decrease in calcium suggests a selective loss. The subsequent rapid deterioration would indicate that there had been massive tissue necrosis. She had overwhelming toxemia when admitted to the hospital. This was progressive until the time of her death. The objective evidence in this patient indicated a lesion causing extensive aseptic tissue destruction, and this, in all probability, was acute hemorrhagic pancreatitis.

Dr. Delp: Dr. Lambert will now enlighten us concerning our patient's disease or diseases.

Pathological Report

Dr. Marian Lambert (pathologist): At autopsy the patient was found to have a generalized peritonitis with about 500 ml. of serosanguineous fluid in the peritoneal cavity. This proved to be sterile on culture. The source of the inflammation was the pancreas, which exhibited the characteristic appearance of diffuse hemorrhagic necrosis. The gland was edematous and studded with friable gray, black, and brownish lesions. Firm, grayish-white areas of fat necrosis

were present in the adipose tissue of the pancreas, mesentery, and omentum. The liver and spleen were remarkable in that both were enlarged and unusual in color. The liver weighed 5,000 grams (normal about 1,800 grams). It was greasy and yellow in color, but there was no evidence of nodularity or an increase in fibrous tissue content. The biliary ducts were patent, and the gallbladder was normal in appearance. The spleen weighed 900 grams (normal about 200 grams). It was dark brown in color and slightly firm in consistency.

Sections of the pancreas revealed extensive destruction due to necrosis and hemorrhage. Only a few small isolated areas of glandular tissue remained intact (Figure 2). It was apparent, however, that the fulminant acute pancreatitis was superimposed upon a chronic pancreatitis because there were focal areas of fibrosis, giant cell reaction, and calcification (Figure 3). The patient's history of an acute episode of epigastric pain, nausea, and vomiting one year before death suggested that there was some degree of pancreatitis at that time. This chronic lesion was consistent with one of that duration.

The pathogenesis of pancreatitis was not clear, but it seemed that the important initial lesion was ob-



Figure 2. Acute hemorrhagic pancreatitis. Section of pancreas showing extensive destruction of the parenchyma from necrosis and hemorrhage.

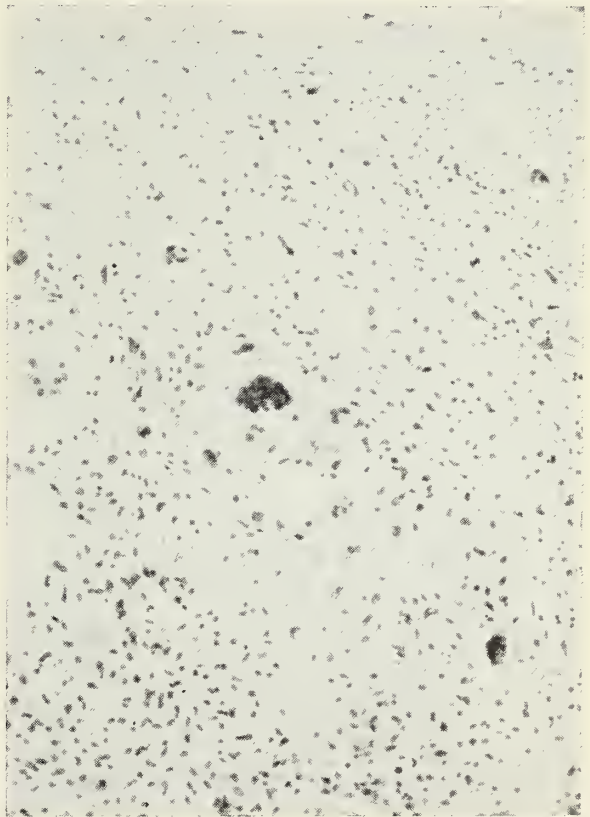


Figure 3. Chronic pancreatitis. Focal area of fibrosis with giant cell formation.

struction of the pancreatic duct. This may have resulted from numerous causes such as biliary disease, spasm of the ampulla of Vater, gallstones, pancreatic calculi, fibrosis, edema, or tumor. A significant fact, however, is that ductal obstruction per se does not usually produce the symptoms or the clinical picture of pancreatitis. This suggests that there must have been some additional factor. Although there are numerous theories based on a variety of experimental procedures,^{2, 3, 4} it seems to be the majority opinion that hypersecretion of the pancreas in the presence of ductal obstruction leads to rupture of the ducts and digestion of the parenchyma by pancreatic enzymes. Fibrinoid necrosis of the walls of the adjacent blood vessels accounts for the local hemorrhage and may result in thrombosis of these vessels, as it did in our patient. The pancreatic enzyme, lipase, hydrolyzes fatty acid esters to produce the fat necrosis with deposition of calcium soap. This chemical reaction may be responsible for fixing enough calcium to produce hypocalcemia.

Obstruction of the main pancreatic duct by calculus was found in this patient (Figure 4). Hypersecretion of the pancreas due to dietary indiscretion could be postulated on the basis of her obesity. The

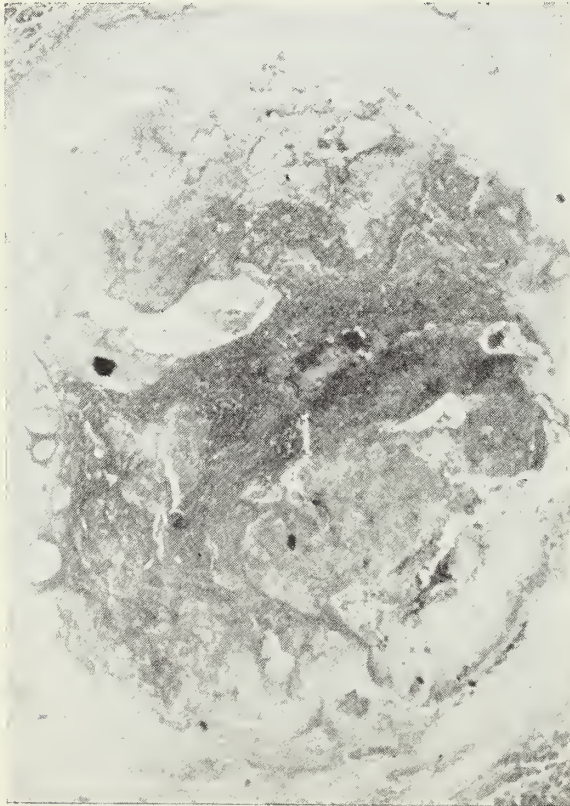


Figure 4. Calculus filling the lumen of the main pancreatic duct. The wall of the duct forms the periphery of the photograph.

splenic and portal veins contained occluding thrombi which produced the massive congestion of the spleen and a partial or so-called "Zahn" infarct of the liver.

The diagnosis of diabetes mellitus was confirmed histologically by the finding of hyalinization of the islets of Langerhans (Figure 5). Undoubtedly, the extreme obesity was also a contributing factor in the development of this disease. Several of the complications of diabetes such as generalized arteriosclerosis, intercapillary glomerulosclerosis, and fatty metamorphosis of the liver were also present. The skin lesions, xanthomata diabeticorum, were found to consist of masses of cholesterol. These are characteristically firm, yellow, non-tender nodules which tend to appear on the extensor surfaces which are subject to injury and on the palms and soles. They are common in all types of hyperlipemia.

We feel that the sudden death was the result of fat embolization because fat emboli were found in the lung, brain, and kidney. This is not an uncommon cause of death in patients with Laennec's cirrhosis or extreme fatty metamorphosis of the liver.

In summary, this 27-year-old, obese woman de-

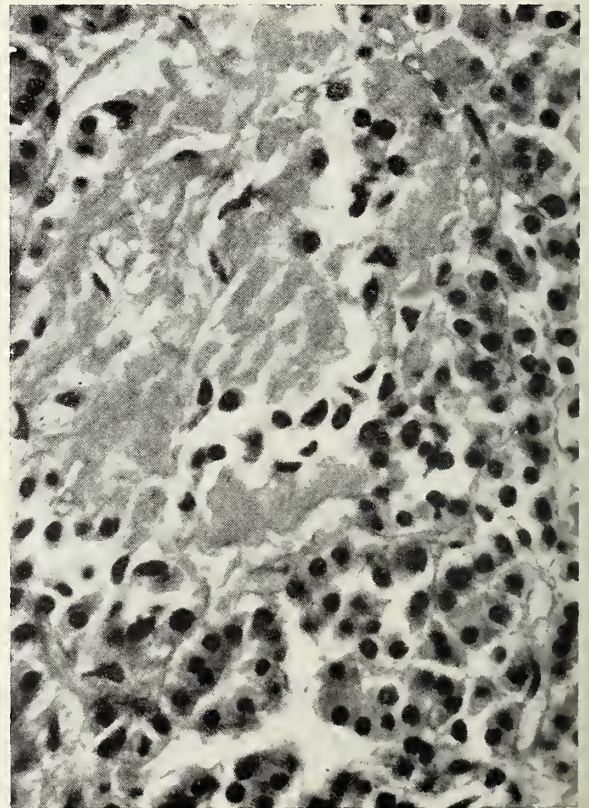


Figure 5. Hyalinization of an islet of Langerhans. The acini surrounding the islet are normal in appearance. The insulin-producing beta cells of the islet, however, have been replaced by an eosinophilic, amorphous material characteristic of hyalin.

veloped diabetes mellitus three years before death. This led to intercapillary glomerulosclerosis (Kim-melstiel-Wilson syndrome) and extreme fatty metamorphosis of the liver. About one year before death she developed chronic pancreatitis which was followed by an episode of fulminant acute hemorrhagic pancreatitis two days before death. This resulted in thrombosis of the splenic and portal veins and generalized peritonitis. The immediate cause of death appears to have been fat embolization.

Dr. Delp: Dr. Lambert, what about the coronary vessels? Were they patent?

Dr. Lambert: She had very slight coronary arteriosclerosis.

Dr. Delp: Are there any questions of Dr. Lambert?

William Hamilton (fourth year medical student): Was there active bleeding in the gastrointestinal tract?

Dr. Lambert: No, there was not.

Mr. Gard: How did the adrenals look?

Dr. Lambert: The adrenals showed only slight lipid depletion due, presumably, to stress.

Mr. Hall: Do you think that this patient had essential hyperlipemia?

Dr. Lambert: No.

Mr. Hamilton: How do you explain this high level of cholesterol in a mild diabetic?

Dr. Lambert: I do not know. She probably had hyperlipemia secondary to her diabetes or to the chronic pancreatitis.

Mr. Hamilton: Did you say there was evidence of chronic pancreatitis, or was this just a case of acute pancreatitis?

Dr. Lambert: This patient had chronic pancreatitis with a terminal acute pancreatitis.

Dr. Delp: I think we should accept this as a case of diabetes mellitus. It has the appearance of being a relatively mild diabetes. It would be convenient to tie the pancreatitis and diabetes together in a causal relationship, but not reasonable. I believe that the hyperlipemia must be explained on the basis of the diabetes mellitus and the disturbances in metabolism attending it. This, I feel, is not uncommon in the extremely obese diabetic. Most patients with extensive xanthomata diabeticorum and lipemic serum are extremely obese.

I suspect that the most important item in the management of this patient—weight reduction—was instituted two years before, but she did not follow it. This could have been much more important than insulin. Unfortunately, she was getting little or no insulin. I believe that she had extensive vascular disease as a result of her long-standing hyperlipemia, because I think that it continued over a period of four years, similar to what we find in patients with

lipoid nephrosis. Those patients also have extensive changes in the cerebral and coronary vessels, as well as the renal vessels.

Summary

Dr. Delp: The patient was a known diabetic who came in with acute, severe abdominal pain suggesting a ruptured viscus. The initial absence of physical signs of peritonitis suggested acute visceral injury; the later appearance of peritoneal irritation pointed to acute pancreatitis as the likely diagnosis. In retrospect, this seems clearly to have been the primary feature of the terminal illness. Diabetic acidosis must have been of secondary importance.

Xanthomata, hypercholesterolemia, and the originally low serum sodium values were interesting but not helpful in recognition of the acute illness.

Pathological Anatomical Diagnosis

Lithiasis of the pancreatic ducts.

Focal remote fat necrosis in pancreas with foreign body giant cell reaction.

Acute hemorrhagic pancreatitis, advanced, with extensive fat necrosis and hemorrhage of the peripancreatic, omental, mesenteric and retroperitoneal fat; thrombophlebitis of the splenic vein and portal vein.

Fibrinous and hemorrhagic peritonitis with 500 ml. of serosanguineous cloudy fluid.

Hyalinization of the islets of Langerhans of the pancreas, moderate.

Intercapillary glomerulosclerosis of kidneys, slight.

Arteriolar nephrosclerosis and arteriolar sclerosis of pancreas, moderate.

Fatty metamorphosis of the liver, advanced.

Fat emboli of small vessels of brain, lungs, and kidneys.

Xantomatosis involving skin, bone marrow of vertebrae, spleen, and interstitices of kidneys.

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Miss Bernice Szukalla, associate director of nursing service at Denver General Hospital since 1951, has been appointed director of nursing service at the University of Kansas Medical Center. She succeeds Miss Harriet Arnold who has become director of nurses at Rhode Island Hospital in Providence.

THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.

DOCTORS OUGHT TO DONATE ONE DAY'S WORK

Governor Docking believes doctors ought to "spend one day a week taking care of public needs," he said Thursday.

He said doctors are educated at state schools and are provided "offices" at hospitals built by the public. The governor said he believes doctors owe something to the public.

He spoke in connection with an announcement that welfare departments are being directed to hold welfare medical payments to an average of \$6.50 per welfare client per month. . . .

He said he never had been able to see why relief funds should be spent to help support doctors who are educated by the state and are making plenty of money.

He said he supposed he would get a telegram from some doctor somewhere who would say he wasn't making plenty of money.

"When you get a tight union such as the AMA (American Medical Assn.) or the Teamsters union, you get a closely co-ordinated group it's hard to buck," Docking remarked.

He hastened to add he was not comparing the standards of the AMA and the Teamsters, but said both are "tight unions."

He was asked if it weren't true the medical aid welfare payments went to hospitals and druggists as well as to doctors.

He said he believed the percentages going to each group are different in the various counties and that the three "battle among themselves" for a share of them.—*Mal Higgins in Topeka State Journal, October 10, 1957.*

REPLY

Quoted below is a press release issued by Dr. Barrett A. Nelson, president of the Kansas Medical Society, in answer to the governor's statements.

This is the third time the governor of Kansas has singled out the medical profession for an official attack. When he privately tells whoever will listen to him that he doesn't like doctors, that is his own

business, as is the private opinion the doctors might have of him.

But when the governor speaks to the people a responsible statement should be forthcoming.

The Kansas Medical Society has twice officially requested audience with the governor about health care for the indigent but has not been invited to do so. When it became obvious Mr. Docking was ignorant upon his favorite subject, this Society then asked some of his friends to carry the true story to him.

Even that failed and what should have been resolved in orderly discussion must now be answered in public because Mr. Docking has once again elected to use the welfare population as his political pawn.

The governor speaks of doctors educated at government expense. May he remember that engineers, lawyers, veterinarians and bankers, too, are educated at government expense and while one hundred doctors graduated last June from the University of Kansas School of Medicine, there were thousands of graduates in other fields from the five state-operated schools in this state. And a doctor of medicine spends much more of his own money to complete his education than does the student in almost any other professional field. If the governor wishes to be consistent, what is his opinion of the obligation those business and professional persons may have to repay their education? Should they, too—the grocer, the farmer, the insurance man, and the banker give in addition to the taxes they pay for the operation of their government, its elected officials, its employees and its wards—should they pay in addition to that one-sixth of their gross income to the welfare client as the governor is asking medicine to do? Or should the doctor of medicine alone be called upon to do this?

A further point we would be glad to have straightened out with Mr. Docking is that less than one-half the doctors in this state received their education at Kansas expense. We have the figures to prove this if Mr. Docking wants them. Moreover, almost half of the Kansas doctors went to private schools that are not supported by tax funds.

But that is merely to answer his peevish outburst. He is just as wrong about the money doctors make from their welfare work and that issue is important, not only to the person on relief, but to everybody.

We declare to the people of Kansas that it was not Mr. Docking who advocated a ceiling of \$6.50 per client per month, but that the Kansas Medical Society suggested and negotiated this figure with the Board of Social Welfare and with the Legislative Council in 1954. The people may recall that both of those dates were well before Mr. Docking was in position to speak for the State of Kansas.

We also have some information on why the pro-

gram has not uniformly been placed into effect before this time and will tell him that if he wants to listen.

There are a few areas, most of them sparsely settled, where physicians obtain usual fees for welfare services. For the most part, those are counties in which the welfare load is usually high and not only the doctor but the grocer and others derive a considerable part of their income from such work.

The vast majority of welfare health service is rendered at one-fourth usual charges and less. We can prove this fact and if the governor pursues his false accusations with one single additional irresponsible public comment, we will give the people of this state the figures as they really are, figures which Mr. Docking has available to him now or at any time he cares to have them.

In the meantime, the doctors of Kansas hold themselves ready, willing, and eager, as they always have, to render medical service unhesitatingly wherever and whenever it is needed, regardless of likelihood of subsequent compensation."

Medical Missionary Dies

Dr. Roy Kenneth Smith, a medical missionary who spent many years of his professional life in Korea, died in California on July 31, according to information reaching friends in Kansas recently. He was known in this state through having spent the period from 1942 to 1946 as resident physician at the Kansas Tuberculosis Sanatorium in Larned. Dr. Smith, ordained a minister by Solomon Presbytery, Kansas, in 1944, served the Presbyterian Church in addition to the medical profession during his tours of duty overseas.

James B. Weaver Laboratory Opened

Announcement was made last month of the opening of the James B. Weaver Laboratory for Orthopedic Surgery at the University of Kansas Medical Center. The laboratory is a memorial to the physician who was on the faculty of the school for 30 years before his death on April 30, 1956, and who for 10 years was head of the section of orthopedic surgery.

The new facility is a completely equipped laboratory for clinical chemistry, and it will be used for research in orthopedics. It contains the "bone bank," a project founded and used extensively by Dr. Weaver. The bank contains human bones used for transplants and grafts in treatment of crippled children and reconstructive surgery in adults.

Initial work in the laboratory will be directed

by Dr. Leonard F. Peltier, professor of surgery and successor to Dr. Weaver as head of the orthopedic section. It will be a continuation of work Dr. Peltier initiated at the University of Minnesota, a study of fat embolism. A grant from the United States Public Health Service will permit continued research in this line.

A James B. Weaver Fund is being set up to accept cash gifts through the University of Kansas Endowment Association, and all monies received will be used for investigative work in orthopedics.

English Physician Appointed

Dr. L. R. C. Agnew, an English physician who was graduated from the University of Glasgow, has been appointed chairman of the department of the history of medicine at the University of Kansas School of Medicine, according to a recent announcement by Dr. W. Clarke Wescoe, dean of the school. The appointment by the Kansas Board of Regents carries with it the faculty rank of associate professor.

Dr. Agnew came to America as an American Cancer Society research fellow at Yale University School of Medicine in 1951. He then served as an associate research professor of pathology at the University of Florida for two years. Immediately before joining the Kansas faculty he was resident tutor in pre-medical studies at Lowell House at Harvard University.

The department was established by the late Dr. Logan Clendening and, since Dr. Clendening's death 12 years ago, has been directed by Dr. Ralph H. Major. Dr. Major has added valuable books to the historical library through his world-wide travels and has attracted many unique gifts. He is now working on a catalogue of the collection, one of the four great history of medicine libraries in the United States.

Basic Science Examinations

The Kansas Board of Basic Science Examiners will give examinations in the subjects of anatomy, bacteriology, chemistry, pathology, and physiology on November 25 and 26, 1957, in the auditorium of Wahl Hall, University of Kansas Medical Center, Kansas City. Satisfactorily completed applications for examination must be submitted at least 30 days prior to the examination. Application blanks and other information can be obtained from R. E. Stowell, M.D., Secretary of the Kansas Board of Basic Science Examiners, Kansas City 12, Kansas.

PHYSICIANS' ACTIVITIES

Dr. Donald L. Rose, of the University of Kansas Medical Center, has been named president of the American Congress of Physical Medicine and Rehabilitation for the 1957-1958 term.

Membership in the International College of Surgeons was conferred last month on **Dr. Wilfred Cox**, Wichita.

Dr. R. C. Anderson, who has been manager of the Veterans Administration Hospital in Topeka since 1946, has gone to Columbus to become assistant commissioner of mental hygiene for the state of Ohio.

The Mississippi Valley Medical Society announces the appointment of **Dr. Clarence H. Benage**, Pittsburg, as director for a two-year term and of **Dr. Thomas P. Butcher**, Emporia, for a one-year term.

Dr. C. Henry Murphy, Topeka-Shawnee County health officer since 1951, is resigning this month to become health officer of Mendocino County, California.

Dr. Don E. Wilcox, Overland Park, has been appointed acting director of the Kansas City-Wyandotte County health department. **Dr. W. J. Madden**, Goodland, has been named health officer of Sherman County, and **Dr. Ross L. Jewell**, St. John, has been appointed health officer of Stafford County.

Dr. M. M. Tinterow, Wichita, became a fellow of the International College of Surgeons at a meeting in Chicago last month.

The name of **Dr. LaVerne B. Spake** has been added to the department of hearing and speech at the University of Kansas School of Medicine as the result of action taken by the board of regents. It is now the "L. B. Spake Department of Hearing and Speech" in recognition of the physician's long time leadership in establishment and development of the

department. He has been a member of the faculty for 33 years.

Dr. Howard V. Bair, superintendent of the Parsons State Hospital and Training Center, attended the ninth Mental Health Institute at Cleveland, Ohio, last month and spoke on "Mental Deficiency: A Psychiatric Problem."

Dr. Arthur K. Owen, who began practice in Topeka in 1913 and pioneered in the field of radiology in that city, moved to Denver last month. He had retired from private practice some years ago, although he continued as a radiological consultant at the Veterans Administration Hospital in Topeka until June of this year.

Dr. E. M. Seydell, Wichita, went to Japan last month to attend a meeting of the Japanese Broncho-Esophagological Society and to present a paper there.

The American Society of Anesthesiologists, Inc., announces that **Dr. Paul H. Lorhan**, of the University of Kansas Medical Center, has been appointed chairman of its Committee on Medical Schools.

Dr. Victor J. Wall, Mahaska, was one of 21 physicians from the United States and Canada who received an award at the 42nd International Scientific Assembly of the Interstate Postgraduate Medical Association meeting in Chicago last month. Awards were given those who had attended ten or more assemblies since 1940.

Dr. Jerome S. Menaker, Wichita, presented a paper before a district meeting of the American College of Obstetricians and Gynecologists in Washington, D. C., last month.

Dr. H. H. Haerle, Marysville, announces that **Dr. Bernard Brock**, formerly of Mission, is now associated with him in practice. Dr. Brock was graduated from the University of Kansas School of Medicine in 1953.

Dr. Richard L. Sutton, Jr., of the University of Kansas School of Medicine, returned recently from a trip to Europe where he attended numerous dermatological meetings. He was also recently elected an hon-

orary member of the Sociedad Venezolana de Dermatologica, Venerologia y Leprologia of Caracas.

Plans to open an office in Louisburg were announced recently by **Dr. Robert B. Hodgson**, a graduate of the University of Kansas School of Medicine who is practicing in Mission.

"The County Medical Society and the American Cancer Society" was the subject discussed by **Dr. Horace M. Wiley** of Garden City at an area meeting of the American Cancer Society recently.

The American Academy of Pediatrics announces the appointment of **Dr. Herbert C. Miller**, of the University of Kansas Medical Center, to its Committee on Medical Education. Dr. Miller is also a member of the Section on Pediatrics of the National Board of Medical Examiners.

Dr. Conrad M. Barnes, Seneca, was one of the speakers at the third annual Symposium on School Health held at the University of Kansas in Lawrence last month. Dr. Barnes is chairman of the Kansas Medical Society's Committee on School Health.

Dr. Louise F. Richmond, Hutchinson, resigned as Reno County physician last month. The position has not yet been filled on a permanent basis, but **Dr. Marion E. Nunemaker** has agreed to serve in the post on a temporary basis.

A plaque honoring the memory of the late **Dr. James Lloyd Jensen**, Colby, has been placed in St. Thomas Hospital in that city.

Dr. Charles R. Svoboda, Chapman, and **Dr. George Steinberger**, Abilene, were speakers at a recent meeting of the Dickinson County unit of the American Cancer Society.

Dr. Marion C. Pearson, Concordia, recently became a member of the International College of Surgeons.

Dr. C. J. Kurth, Wichita, president of the National Guild of Catholic Psychiatrists, went to Gal-

veston last month to preside at a meeting of the organization's executive committee.

Dr. Lewis L. Robbins, chairman of the psychotherapy research project at the Menninger Foundation, Topeka, has announced his resignation from that position, to be effective on June 1, 1958. He has accepted appointment as director of professional services at Hillside Hospital, New York City.

"What Everyone Should Know about Doctors" is the subject chosen by **Dr. J. Warren Manley**, Kansas City, for an address given to the Kansas City High Twelve Club recently.

Dr. Howard M. Lamborn, Jr., has announced the opening of an office for general practice in Leavenworth.

The American Medical Writers' Association announces the election of **Dr. Karl A. Menninger**, Topeka, as second vice-president.

Seven Kansans were inducted as fellows of the American College of Surgeons at a meeting in Atlantic City last month: **Dr. Ben H. Buck, Jr.**, and **Dr. Ernest P. Carreau** of Wichita; **Dr. Richard C. Tozer**, Topeka; **Dr. Raymond A. Schwegler**, Lawrence; **Dr. Francis L. Brochu** and **Dr. Charles A. Hunter, Jr.**, Kansas City, and **Col. George F. Peer**, Fort Leavenworth.

Dr. C. O. Hoover, Quinter, and **Dr. James Ruble, Jr.**, and **Dr. Kenneth J. Simpson**, Overbrook were pictured on the Dave Garroway "Wide, Wide World" television show on October 27. The program showed the life of a doctor in the "horse and buggy" days and in the present era in rural communities.

Dr. E. E. Tippin, Wichita, was speaker at a meeting of the Bethel College Women's Association, Hillsboro.

Plans to practice in Mission have been announced by **Dr. W. P. Pearce**, former instructor in the department of obstetrics at the University of Kansas Medical Center.

Dr. J. P. Berger, Wichita, was named president of the Kansas Division of the American Cancer Society at the organization's annual meeting in Hutchinson last month. **Dr. D. Cramer Reed**, Wichita, was elected delegate to the national board of directors meeting.

Plans to practice in Hays in association with **Dr. John Thurlow** and **Dr. Irvin Mattick** have been announced by **Dr. Roy Coffey**, a son of the late **Dr. Frank Coffey** of Hays. The young physician will begin practice in Hays upon completion of his assignment with the U. S. Air Force.

Dr. R. H. Ohman, Dodge City, discussed activities of the American Cancer Society at a district meeting of the organization in Dodge City last month.

The Cowley County Association for Mental Health sponsored a public meeting in Arkansas City last month with **Dr. Paul C. Laybourne**, of the University of Kansas Medical Center, as speaker.

Medical Assistants' National Meeting

Approximately 400 medical assistants from all parts of the nation gathered in San Francisco, October 4 and 5, for the first annual meeting of the American Association of Medical Assistants. **Dr. Murray C. Eddy**, Hays, advisor to the group, headed the Kansas delegation of 26 members.

Miss Maxine Williams, Kansas City, who played a major role in the formation of the national association, who served as chairman during the year of organization and was the group's first president, presided at all sessions.

Business meetings occupied a large portion of the time of the delegates, as might be expected for a new organization. However, programs were presented to instruct in basic human relations, medical nomenclature, x-ray work, laboratory work, assisting in office surgical procedures, and business office routines. One morning session was devoted to an exchange of ideas among the states on advantages of membership, increasing membership, programs, publications, training courses, duties of officers and chairmen, and placement bureaus.

Social events included a reception given by the American Medical Association, the California Medical Association, and the California Medical Assistants' Association at the Top of the Mark, a din-

ner at the Mark Hopkins Hotel, and a luncheon and banquet at the Sheraton Palace Hotel.

Mrs. Mary Kinn, Santa Ana, California, will serve as president of the group during the coming year, with Mrs. Lucille Swearingen, Bartlesville, Oklahoma, as president-elect. The 1958 meeting will be held in Chicago and the 1959 session in Philadelphia.

ANNOUNCEMENTS

Interim session, American College of Chest Physicians, Warwick Hotel, Philadelphia, December 2-3. Programs available through the College, 112 East Chestnut Street, Chicago 11, Illinois.

General practice review, University of Colorado Medical Center Postgraduate Course, 4200 East Ninth Avenue, Denver, January 13-18. Monday, Medicine; Tuesday, Pediatrics; Wednesday, Surgery; Thursday, Laboratory Medicine and Radiology; Friday, Obstetrics and Gynecology; Saturday, Trauma. Registration available for full course or selected days.

Part I examinations, American Board of Obstetrics and Gynecology, January 2, various cities. Candidates notified as to eligibility must submit case abstracts within 30 days of notification. Outline of requirements available from Board, 2105 Adelbert Road, Cleveland 6, Ohio.

Cash award and certificate of merit to be given by International Academy of Proctology for best unpublished contribution on proctology or allied subjects. Closing date for entries, February 1. Information available from Academy, 147 Sanford Avenue, Flushing, New York.

Symposium on fundamental cancer research, March 6-8, University of Texas M. D. Anderson Hospital and Tumor Institute, Houston. Topic is "Radiation Biology and Cancer."

Eight research fellowships available, Department of Pathology, New York University-Bellevue Medical Center. Stipends from \$3,600 to \$4,500 annually. Two senior fellowships available with stipends of \$7,500. Write the Dean, 550 First Avenue, New York 16, New York.

Amebiasis

A Study of Incidence, Diagnosis, and Modes of Therapy

CHARLES R. PHIPPS, M.D., *Wichita*

Amebiasis is a term that should be used to designate all conditions which result from the invasion of tissues by *Endamoeba histolytica*. Frequently the organism is present but symptoms will be minimal or absent. Amebic dysentery is only one of the many manifestations of the disease and is the exception rather than the rule. Amebiasis is cosmopolitan in its distribution and is not confined to the tropics. It is an important public health problem even here in the United States, and every general practitioner should be cognizant of this and be acquainted with its varied symptomatology and treatment.³

Incidence

The incidence of amebiasis is directly related to sanitation, but this should not distract the physician from being suspicious even though conditions of the surrounding community are apparently good. Terry states: "Studies on the incidence of amebiasis throughout the world indicate that the disease is found wherever it is suspected and looked for."²⁷ It is estimated that 6 to 10 per cent of the total population of the United States is infected. The incidence is higher in the lower economic areas but is sufficiently high in all areas to make it a serious concern to physicians and public health workers. Anderson et al.³ believe the disease is perhaps even more common than syphilis or malaria in the United States and is considered by many authorities to be equally chronic and capable of relapse.

"Prevalence rates among veterans range from 10.1 per cent of those with domestic service only to 28.3 per cent of those serving in the China-Burma-India Theatre."⁸ Institutional rates are far higher than in the general population. It can readily be seen that in areas with returning veterans and in areas in any way connected with institutionalization the incidence can be expected to be higher.

Etiology and Pathogenesis

Amebiasis is an infection in man and other mammals caused by a protozoan *Endamoeba histolytica* of the

class Rhizopoda.³ Infection occurs through ingestion of the organism. The organism is usually encountered in either the trophozoite or the cystic form. Trophozoites are destroyed by gastric secretions, but the cystic form passes unchanged to the distal ileum and colon where the encystment takes place. Here the cysts are broken down by the action of intestinal secretions, activating the four nucleated cysts into four motile trophozoites.²⁴

Invasion of the bowel wall takes place by three means: (1) cytolytic enzymes secreted by the trophozoites, (2) motility of the trophozoites and (3) the intestinal bacteria which produce cytolytic enzymes, lower tissue resistance, and produce infection and inflammation. The trophozoites multiply by binary fission in the tissues and then pass to the lumen of the bowel where encystment always takes place. Cysts so produced will not reinfect the host unless they are swallowed and reach the colon via the stomach. The number of cysts excreted per day varies between 330,000 to 45 million and occurs in cycles.²³

The depth of invasion into the bowel wall is usually limited by the resistant muscularis mucosae, although the ulcers may extend into it and rarely perforate. It is because of this resistance that the classical Erlenmeyer flask-shaped ulcer is formed. Even though this is classical, ulcers may vary in size, shape, and appearance.³⁰

Thrombotic lesions in the portal vein follow the invasion or erosion of the organism into the mesenteric veins and subsequently give rise to hepatic amebiasis. If the liver is normal, the majority of amebas do not survive there. In the hepatitis stage there is a fatty infiltration and degeneration of liver cells associated with a low grade infection. As this inflammation becomes chronic, an abscess is formed. In early and small abscesses there are numerous amebas, but as the pathology becomes chronic these decrease in number. The contents of the abscess is characteristically chocolate colored. Abscesses are usually located in the right lobe and may vary from 1 to 20 cm. in size.²³

If there is erosion into the mesenteric lymphatics, the amebas enter the lungs via the heart and may enter the systemic circulation with resultant lesions in almost any organ. Pulmonary amebiasis may be sec-

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Phipps is now serving his internship at Wesley Hospital, Wichita.

ondary to hepatic amebiasis by direct extension or may be hematogenous in origin.²⁴

Symptomatology

The symptoms of amebiasis are many and varied and, like many other diseases, this one often simulates other disease entities and is misdiagnosed. The symptomatology discussed here will be referable to intestinal amebiasis, and symptoms of extraintestinal amebiasis will be discussed under the various complications.

Sodeman says, "In the colon amebiasis may manifest itself in one of four ways: (1) There may be no symptoms; (2) There may be general evidence of low-grade infection; (3) There may be active colonic symptoms with or without diarrhea or dysentery; or (4) There may be extracolonic localizing symptoms simulating appendicitis, gallbladder disease, peptic ulcer, or other disease entities."²⁵

Acute amebic dysentery may be mild, moderate, or fulminating. The incubation period may be a week or many months. Onset may be sudden or follow repeated attacks of diarrhea. The patient usually has severe abdominal pain, diarrhea, cramps, and tenesmus and may have chills, nausea, vomiting, and dehydration. The stools, varying from 15 to 35 daily, usually contain a considerable amount of mucus and blood. Fever is usually absent but in severe cases may be present.²³ This form of the disease is rare in this country. Sodeman²⁶ estimates that 95 per cent of patients with amebiasis do not have active diarrhea or dysentery.

Chronic intestinal amebiasis in contrast to acute intestinal amebiasis begins insidiously with variable symptoms. Constipation is a more constant feature than diarrhea, although diarrhea may occur late or may alternate with constipation.²⁷ Various authors have described numerous symptoms which include the following: diarrhea, constipation, abdominal gaseous distention, capricious appetite, weight loss, dull headache, sleepiness, unpleasant dreams, poor memory, nervous irritability, muscle aches, fever or subnormal temperatures, arrhythmias, tachycardia, vasomotor disturbances and anemia.¹¹

Weiser et al.³⁰ in a breakdown of symptoms on their series of 50 cases noted the frequency of the following: (1) abdominal pain, 80 per cent of all patients—being more frequent in the lower quadrants but capable of occurring in any quadrant; (2) diarrhea, 48 per cent of all patients: (a) mucoid, 40 per cent; (b) watery, 8 per cent; (c) recurrent, 40 per cent of all patients with diarrhea; (d) continuous, 58 per cent of all patients with diarrhea; (e) alternating with constipation, 2 per cent of all patients with diarrhea; (3) nausea and vomiting, 28

per cent of all patients; (4) flatus (excessive), 34 per cent of all patients and (5) no symptoms, 6 per cent of all patients.

Physical Examination

General physical examination often reveals nothing of significance. Certain complications, however, such as hepatic or pulmonary infection may direct attention to the causative agent. Masses or generalized tenderness may be present, but at other times the abdominal examination is entirely normal. Digital examination of the rectum is usually normal except in far advanced cases, and then the ulcers are indistinguishable from those of tuberculosis.⁴

Complications

In this country complications, with the exception of hepatic involvement, are relatively rare. Many of these will be mentioned but not discussed. The discussion will involve only the more frequent complications.

Complications can be divided into two categories, local and distant. Local complications include perforation, rectovaginal fistula, appendicitis, diverticulitis, hemorrhage, stenosis, and ameboma formation. The symptoms of the first six are the same as when these clinical entities are due to some other etiological agent and need not be reviewed here.³⁰

Pseudopolypoidosis, another local complication, is associated with chronicity, and the symptoms are generally those of colitis.³⁰

Ameboma is important because of the difficulty in differentiating it from carcinoma. Ameboma is due to repeated invasion of the colon wall by *E. histolytica* with subsequent granulomatous formation. The most frequent locations are the rectum, cecum, transverse colon, sigmoid, and ascending colon. The clinical picture includes diarrhea, lower abdominal cramps, loss of weight, fever, palpable mass, obstructive symptoms, tenderness, filling defect by barium enema, and the disappearance of the lesion following antiamebic therapy. The mortality rate is approximately 40 per cent due to faulty diagnosis and surgical intervention for intestinal obstruction or neoplasm.

Distant complications include hepatic amebiasis, pulmonary amebiasis, amebiasis of the genitourinary tract, pyelophlebitis, thrombosis of the vena cava or renal vein, prostatic involvement, cutaneous amebiasis, and abscesses of the brain, spleen, ovary, and testes. All of these, with the exception of hepatic amebiasis, are too infrequent to warrant a detailed discussion although they should always be considered when symptoms of these various organs occur.

The onset of symptoms in hepatic amebiasis may be acute or insidious.³⁰ It may follow within a few

weeks or even years following intestinal involvement. Confusion of the symptomatology with other forms of hepatic disease is common.

The symptoms of amebic hepatitis usually include a large tender liver, slight or no jaundice, tenderness in the upper right quadrant, digestive disturbances, fever, chills, and leukocytosis. One may or may not get a past history suggestive of amebiasis.^{24, 26} There is usually a disproportion between the signs and symptoms and the liver function studies. These studies are usually mildly abnormal or even normal.³⁰

Often the diagnosis of amebic hepatitis must be made on clinical grounds plus serologic support without actual identification of the organism. Clinical signs of hepatitis with mild or absent jaundice, the mild abnormality of the liver function tests, the leukocytosis, the positive serologic test, and the response to specific therapy, usually constitute the evidence from which the diagnosis is made.⁸

Liver amebic abscesses usually have a sudden onset and are characterized by chills, fever, perspiration, pain, and tenderness in the upper right quadrant. The patient appears acutely ill and has varied gastrointestinal symptoms. There is marked hepatomegaly with rounded edges. Laboratory examination results include a marked leukocytosis with a shift to the left and often normal liver function test, but there may be a delay in the excretion of bromsulphalein and rarely a positive flocculation test. Parasites may be found in the stools of a third of the patients. X-ray examination shows an elevation, tenting, and fixation of the right half of the diaphragm, congestion of the base of the right lung, and some effusion in the right pleural cavity. The aspiration of chocolate colored pus confirms the diagnosis. Parasites may be found in a sixth of these aspirates.²³

Diagnosis

The diagnosis of amebiasis can only be suspected by the history and physical examination; the final diagnosis rests in various laboratory techniques. These laboratory aids are: direct examination of the stools, culture, complement fixation test, sigmoidoscopic examination, x-ray, and miscellaneous aids.

Examination of the stools: As with other parasitic and bacteriologic diseases, the demonstration of the causative organism affords a conclusive diagnosis. The typical stool of the acute dysentery is reddish brown and contains considerable amounts of blood and mucus. The vegetative forms of the *E. histolytica* occur almost exclusively in liquid stools and deteriorate rapidly on standing, therefore these must be examined immediately or smears must be fixed for subsequent examination. Formed stools to be ex-

amined for cysts may be stored in an icebox overnight, but these will degenerate as time progresses.²⁶

If the laboratory facilities or technicians are not immediately available, a preservative may be added to liquid stools to preserve the trophozoites. The fixative recommended by Seneca²⁴ is polyvinyl alcohol (PVA) and is formulated as follows:

| | |
|---|----------|
| Dissolve at 75° C. | |
| Powdered PVP | 5.0 gm. |
| Glycerol | 1.5 cc. |
| Glacial acetic acid | 5.0 cc. |
| Saturated HgCl ₂ solution in water | 93.5 cc. |

The stools are mixed in three or more parts of the fixative, and this is suitable for staining for several months and also easy to ship. Although this is useful to preserve trophozoites, the cysts and ova become distorted and the solution cannot be used to preserve them.

In the collection of formed stool an average of six stool specimens should be obtained, preferably on different days because of the cyclic nature of the cysts. No castor oil, mineral oil, or barium should be given prior to examining the stools. However, diagnostic efficiency is greatly enhanced if a mild saline purgative or saline enema is given before the last specimen is obtained. This should be done on the last specimen rather than one of the preceding because this may interfere with examination of the stools for several days. Sodeman²⁶ says this increases the per cent of positive stools from 65 to 90.

MacDonald¹³ describes the following method for microscopic examination. For a direct smear a small amount of feces is obtained on an applicator and placed on each end of a glass slide. These may be mixed with a drop or two of saline. One is covered with a cover slip and examined immediately for motile forms while to the other a drop of Donaldson's iodine, D'Antoni's iodine, or fresh Lugol's solution is added and covered with a cover slip. This one is examined for cysts. This direct smear may also be strained with iron-hematoxylin stain and examined for either trophozoites or cysts.

When the above method for microscopic examination is unproductive, then each specimen should be concentrated as this will frequently reveal cysts when they were not observed on the direct smear. Two concentration methods are described by Seneca,²⁴ the zinc sulfate centrifugal flotation and the formalin-ether sedimentation.

Zinc Sulfate Centrifugal Flotation:²⁴ 1. "Suspend feces, 1 to 10 parts, in tap water and filter through wet cheesecloth, and put about 10 cc. in a Wassermann tube.

2. "Centrifuge for 45 to 60 seconds at 2,500 rpm, decant the supernatant, resuspend in water to fill the

tube. Repeat two or three times, until the fluid is clear.

3. "Decant fluid and resuspend in zinc sulfate solution (sp. gr. 1.18 and 33 per cent) and centrifuge for 45 to 60 seconds.

4. "Remove several loopfuls of the floating surface material or film and add to a drop of Lugol's iodine on a slide and examine under the low power and high power lenses of the microscope."

Formalin-Ether Sedimentation:²⁴ 1. "Centrifuge 10 cc. saline suspension of feces, filtered through wet cheesecloth, three to four times until the supernatant is clear.

2. "Decant supernatant and replace with 10 per cent formalin. Mix thoroughly and set test tube aside for five minutes.

3. "Add 3 cc. ether and shake vigorously.

4. "Centrifuge at relatively low speed for two minutes. There will be a small amount of sediment containing the cysts and ova, a layer of formalin, a plug of debris, and a surface layer of ether."

Culture of amebas: *E. histolytica* can be cultured from stools and amebic abscesses but Seneca²⁴ doesn't believe this is practical for diagnostic purposes. Powell²⁰ believes cultures are inferior to direct examination but that they might be beneficial as a supplement to direct examination.

Complement fixation test: There is considerable controversy as to the reliability of this test in diagnosing amebiasis. McDearman and Dunham¹⁵ found this test of value in diagnosing extraintestinal amebiasis. They found that 86 per cent of their proved cases of extraintestinal amebiasis had positive tests; 32 per cent of their proved intestinal amebiasis had positive tests; 16 per cent of their equivocal cases had positive tests, and none of their controls had positive tests.

The greatest difficulty with the test is that there is no standard antigen. The antigenic material also contains bacterial fractions which may give false positive reactions.²⁴ Commercial antigens are available, and these were used in McDearman and Dunham's series.

Kenney et al.¹⁰ state that in evaluating the complement fixation test for amebiasis, it is important to remember that a sufficient interval is required between the time of infection and the detection of antibodies and, as with other complement fixation tests, two tests should be done to determine a rising or falling titer. They don't believe this serologic test alone establishes a diagnosis but they do believe the following: (1) It can be used with a feeling of security in eliminating suspected liver involvement; (2) It can help to suspect active amebiasis with vague symptomatology and negative stools; (3) It

can help to evaluate the degree of involvement in known cases of amebiasis; and, finally, (4) It can aid in therapy by indicating the course to follow when ameba are apparently absent from the stool.

Sigmoidoscopic examination should be performed in every suspected case. The lesions may consist of small pinhead irregular areas of inflammation surrounded by hyperemia and edema, or small projecting nodular elevations with a small opening at the apex. These latter areas contain a gelatinous material with motile trophozoites. When these areas are encountered, this material should be placed on a slide and immediately examined for the trophozoites.¹³ Seneca²⁴ reports, in a series of 300 patients, 211 were found positive by this method.

The patient is prepared by giving an enema the night before examination and then cleansing enemas prior to examination.

X-ray examination: Bargen⁴ believes a barium enema is important in patients with amebiasis, although the results are usually negative. He believes this aids in ruling out other intestinal lesions. When positive signs of amebiasis are present, they are usually located in the cecum and ascending colon and usually consist of a deformity that resembles other chronic ulcerative diseases. The x-ray evidence of hepatic involvement has already been described.

Miscellaneous findings: The erythrocyte sedimentation rate is increased and the blood picture reveals hypochromic anemia. There is leukocytosis with a liver abscess. Liver function tests may be normal or they may show delayed excretion of Bromsulphalein and positive cephalin flocculation.²⁴

Treatment

The purpose of treatment is threefold: (1) destruction of amebas in the tissue, (2) destruction of amebas in the lumen of the intestine and (3) healing of the ulcerative lesions.⁴

Management of patients with amebiasis must be individualized; there is no highly satisfactory drug for treatment. Many drugs provide effective control of acute amebiasis, but many have toxic side effects and the relapse rate is frequently high. Drugs that are effective against tissue forms of the ameba have little value in intestinal amebiasis and vice versa. Therefore, treatment frequently consists of a combination of both types of drugs.¹⁴ Treatment will be discussed under four headings: treatment of intestinal amebiasis, treatment of extraintestinal amebiasis, surgical treatment, and symptomatic treatment.

Treatment of intestinal amebiasis can be subdivided into: antibiotic, halogenated hydroxyquinolines and arsenicals.

Numerous antibiotics have been used in treatment of amebiasis, but only a few have been proved of value. Many of these, including penicillin and streptomycin, are not considered as acceptable antiamebic drugs. The following is a summary of the reports McHardy et al.¹⁶ garnered from the literature.

| <i>Antibiotic</i> | <i>No. of Patients</i> | <i>No. of Recurrences</i> | <i>Failure Incidence</i> |
|--|------------------------|---------------------------|--------------------------|
| Chlortetracycline (aureomycin) | 697 | 116 | 16.6% |
| Oxytetracycline (terramycin) | 435 | 37 | 8.5% |
| Bacitracin | 205 | 65 | 31.2% |
| Chloramphenicol | 72 | 53 | 73.6% |
| Neomycin | 22 | 14 | 63.6% |
| Fumagillin | 119 | 28 | 14.0% |

Aureomycin, Terramycin, and fumagillin, by this survey, were the most effective antibiotics. This seems to be consistent with most surveys although results vary widely, as can be seen in some of the following:

| <i>Investigator</i> | <i>% Relapse with Terramycin</i> | <i>% Relapse with Aureomycin</i> |
|--|----------------------------------|----------------------------------|
| Weiser et al. ³⁰ | 63 | 38 |
| Crosnier et al. ⁵ | 0 | 40 |
| Abd El-Ghaffar et al. ¹ | 42 | |

The usual dosage of Terramycin and Aureomycin is 500 mg. every six hours for a total of 20 gm. and fumagillin in 10-20 mg. doses three times a day for 10 days.

Villarejos²⁹ believes erythromycin is a valuable therapeutic agent. In a series of 36 patients he had 3 per cent relapse, using an initial dose of 800 mg. and a daily dosage of 1.2 gm. for five days. Other dosage schedules were used, but this was the most effective. Jung et al.⁹ also found erythromycin as well as fumagillin to be an effective amebicide.

Puromycin, a new antibiotic, was used in the treatment of 28 patients. It was found to be effective in patients who harbored only cysts, but was not effective in patients with ulcers and trophozoites. A combination of this and Achromycin was effective.²

Halogenated hydroxyquinolines: Chiniofon, Diodoquin, and Vioform are still in use despite the fact that other drugs are more effective.²² It should be stated that these drugs in combination with other amebicides are often effective. Chiniofon (iodoxyquinoline sulfonic acid) is used in cyst carriers in a dosage of 0.75 to 1 gm. three times a day for 8 to

10 days. The side effects of these compounds are few.

Arsenicals: Carbarsone, Milibis, thioarsenites and Arsthinol are some arsenicals that have been used. Carbarsone, in a dosage of 0.25 gms. twice a day for ten days and then repeated after a two-week interval, is superior to most arsenicals. Arsthinol has been used recently with encouraging results. The greatest disadvantages with these drugs are their potential toxic effects.²⁴

A combination of different drugs has proved effective. Resotren, a new drug with a chemical combination of chloroquine and chiniofon, has recently been reported by Pfannmueller¹⁹ to be effective against intestinal and extraintestinal amebiasis. He reviewed a series of 42 patients, 5 of which had uncomplicated amebic dysentery, 31 had amebic hepatitis and 6 had liver abscesses. All of the dysentery patients and those with abscesses had a clinical cure and negative stools. Thirty of the 31 hepatitis patients had a clinical cure while 29 had negative stools. The dosage of 40 tablets was given as follows:

| | | |
|----------------------------|----------------|----|
| 1st day | 3 x 2 tablets | 6 |
| 2nd to 5th day | 4 x 1 tablet | 16 |
| 6th to 10th day | 3 x 1 tablet | 15 |
| 11th to 12th day | 1 x 0.5 tablet | 3 |
| 12 days | | 40 |

If the condition of the patients was considered severe, a further course of 20 tablets in four days was given eight days after the first course. If an acute liver abscess was present, chloroquine was also given for the first two to three days.

Radke²¹ has used a combination of Atabrine and carbarsone with only a 12 per cent relapse rate.

Loughlin and Mullin¹² have found a combination of diiodohydroxyquinoline, chloroquine, bacitracin, and neomycin to be quite effective. By using the combination they could reduce the dosage of the latter three drugs.

Other combinations used have been streptomycin, polymyxin, neomycin, and bacitracin. Shafei,²⁵ in a series of 30 cases, reported a 70 to 90 per cent cure depending on dosage.

A new drug, triamar, under preliminary study has been indicated as a potent amebicide. It is a combination of 60 per cent Diodoquin and 40 per cent glycolylarsanilic acid.

Treatment of extraintestinal amebiasis is completely different because in general the types of drugs used for intestinal amebiasis are ineffective for extraintestinal amebiasis and vice versa. Chloroquine (Aralen) and emetine are the two drugs used most commonly, but erythromycin and fumagillin have shown encouraging results.

According to most investigators, including Hamilton,⁷ chloroquine is now considered the drug of choice. The dosage is 1.0 gm. of chloroquine diphosphate daily for 2 days and then 0.5 gms. for 19 days. The drug has few side effects. If toxic symptoms do appear, the drug is discontinued for 24 to 48 hours and then resumed.

Emetine has such a potential toxic effect it should be reserved for those patients where other measures have failed.²⁴

Nelson et al.¹⁸ have received favorable results with erythromycin in the treatment of amebic hepatitis. In a series of 28 patients, 20 showed a definite favorable response. The dosage for adults was 1.0 gm. in divided doses per 24 hours for 14 days. Six of the patients that didn't respond to erythromycin showed a good response to chloroquine.

Novobiocin is amebicidal and has a bacterial spectrum similar to erythromycin. It may prove to have a place in the treatment of extraintestinal amebiasis.²⁴

It is obvious that many of the complications of amebiasis have surgical significance and should be treated as such. These include appendicitis, perforation with peritonitis, massive hemorrhage, ameboma, cicatricial stenosis, pseudopolyposis, hepatic abscess, pleuropulmonary complications, cerebral abscess, cutaneous ulceration and abscess, splenic abscess, and genitourinary complications.⁶

The mortality rate following operations on untreated or undiagnosed patients with amebiasis is considerable. Theron²⁸ gives the following reasons: (1) reduced resistance as a result of chronic infection, (2) interference with wound healing with an occasional occurrence of ulceration and sloughing of the skin of the abdominal wall, (3) the tendency to breakdown at the suture line after operative intervention on the bowel, (4) development of acute amoebic dysentery in the immediate postoperative period, and (5) a mild hepatitis during the postoperative period.

Symptomatic treatment: Because of possible nutritional disturbances, avitaminosis, and hepatic dysfunction, patients should be put on a high carbohydrate, high protein, high vitamin diet. Parenteral injections of vitamin B₁₂ two to three times a week are helpful. Iron and liver extract may be indicated for anemia. Secondary infections should be controlled with the proper antibiotic.²⁴

"In assessing the results of therapy it is essential that strict criteria of cure be established. Certainly a patient should become and stay free of all symptoms and signs attributable to amebiasis. Repeat stool examinations at intervals of several weeks with negative findings over a period of one year would seem the minimum requirement in post-treatment follow-up."⁵⁵

Summary and Conclusion

1. Amebiasis is an endemic disease in the United States, estimated by some authorities to affect 6 to 10 per cent of the total population.

2. Chronic intestinal amebiasis is the most frequent form of the disease in the United States and therefore should be suspected when vague abdominal symptoms are present. Physical examination is usually non-revealing.

3. Complications, with the possible exception of hepatic involvement, are unusual but should always be suspected and looked for when symptoms of the various organs occur.

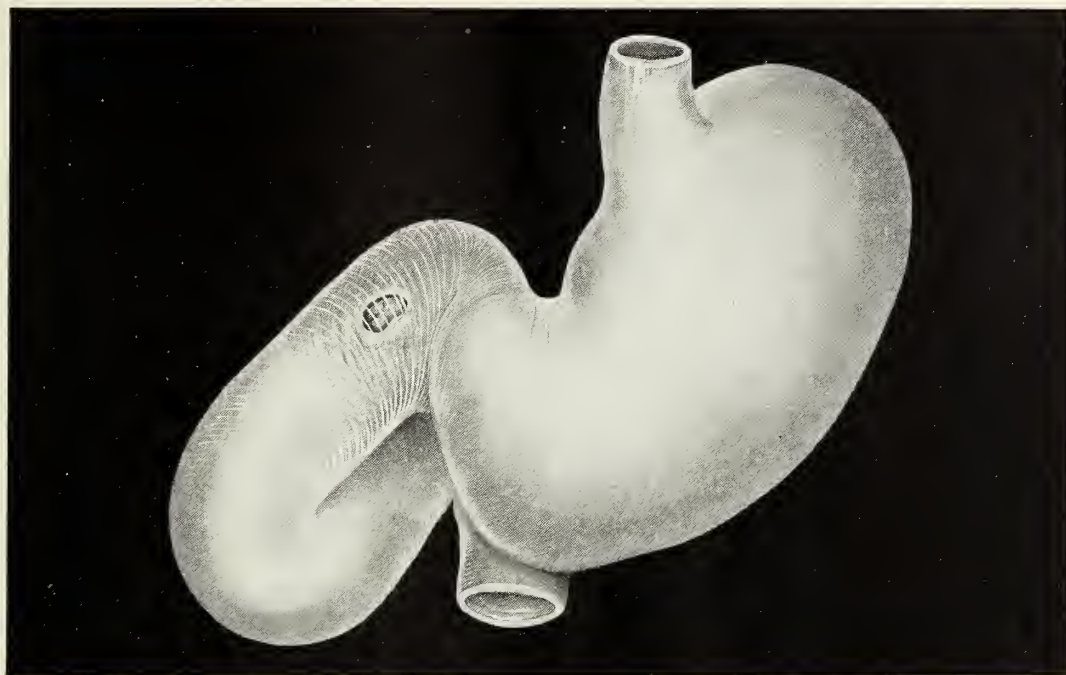
4. Since symptoms are variable and physical signs are meager, the final diagnosis always rests with demonstration of characteristic lesion of various organs and/or demonstration of the organism, *E. histolytica*. Sigmoidoscopy has proved helpful. The complement fixation test is of value in the diagnosis of extraintestinal amebiasis but is of little diagnostic value in intestinal amebiasis.

5. There is no highly satisfactory treatment for amebiasis. Terramycin and fumagillin are probably the most effective antibiotics while carbarsone is the best arsenical available. A combination of carbarsone with one of the antibiotics is probably the treatment of choice for intestinal amebiasis. According to most investigators, chloroquine is still the drug of choice in extraintestinal amebiasis. Several other drugs and combinations of drugs have proved to be effective.

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*Lichstein, J.; Morehouse, M. G., and Osmon, K. L.: Pro-Banthine in the Treatment of Peptic Ulcer. A Clinical Evaluation with Gastric Secretory, Motility and Gastroscopic Studies. Report of 60 Cases, Am. J. M. Sc. 232:156 (Aug.) 1956.

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Muscular Dystrophy Abstracts

Muscular Dystrophy Associations of America, Inc., has announced a new service, the publication of a series of monthly muscular dystrophy abstracts for research scientists and others interested in muscular dystrophy and related diseases. The project is being carried out with a subsidy from the Association by the Excerpta Medica Foundation of New York and Amsterdam, Holland.

The first booklet, of which 300 have been distributed, presents summaries of 59 recent papers by

scientists in this country and abroad. The papers are classified into two groups: abstracts from the clinician, concerned mainly with general anatomic-clinical publications, and abstracts of articles concerning the basic sciences relating to muscular dystrophy.

The abstracts are sent to association research grantees and clinic workers and other professional individuals and institutions.

The association has made grants for nearly 100 research projects throughout the world and is establishing an Institute for Muscle Disease adjacent to the New York Hospital-Cornell Medical Center in New York City as a major center for research into muscular dystrophy and related diseases. In addition, 41 clinics in the United States provide physical therapy and other care for patients. Funds for MDAA's work are raised by more than 300 chapters.

Course in Medical Technology

The ninth annual postgraduate course in medical technology will be offered at the University of Kansas Medical Center, Kansas City, January 6-8. Among the 37 faculty members for the course are Dr. George E. Cartwright of Salt Lake City, Dr. Bradley E. Copeland of Boston, and Dr. Robert D. Wise of Philadelphia.

Subjects of current interest in microbiology will be presented on January 6; hematology will be discussed on January 7, and clinical laboratory medicine and a chemistry symposium will make up the program on January 8. Panel discussions will follow the presentations.

Participants will have an opportunity to attend four workshops, choosing from 15 to be offered. Enrollment fee for the three days is \$12. Programs may be obtained from the Department of Postgraduate Medicine, University of Kansas Medical Center, Kansas City 12, Kansas.

A.M.A. Sets Up Research Foundation

The American Medical Research Foundation recently was established by the A.M.A. Principal purposes of the foundation will be: (1) to promote the betterment of public health through scientific and medical research; (2) to plan and initiate scientific and medical research, and (3) to collect, correlate, evaluate, and disseminate results of scientific and medical research activities to the general public. Voting members of the foundation will be A.M.A. trustees. Meetings will be held annually at the time of the A.M.A. annual sessions.

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BOOK REVIEWS

Current Surgical Management: A Book on Alternative Viewpoints on Controversial Surgical Problems. Edited by John H. Mulholland, Edwin H. Ellison, and Stanley R. Friesen. Published by W. B. Saunders Company, Philadelphia, 1957. 494 pages. Price \$10.

The experience and judgment of 76 contributors are focused upon 28 controversial surgical problems. Many of the names are familiar as authors of recent articles on these problems. However, in this instance they have been specifically challenged by the editors to present the case for one form of operative management in a symposium of alternative methods. The articles are written for this purpose and have not appeared elsewhere.

The editors state that the creation of this volume arose out of the inclination of surgeons to argue their differences. Each "problem" is presented with a brief preamble by one of the editors who, it is admitted, finds some difficulty in remaining non-partisan. They add that a book such as this does not provide answers. It does demonstrate how certain authorities arrived at their own answers. Credit is given the publisher for the original idea.

Consideration is given to:

- Acute cholecystitis
 - early or delayed operation?
- Chronic pancreatitis
 - sphincterotomy?
 - pancreaticojejunostomy?
 - choledochojejunostomy?
- Choice of operation for duodenal ulcer
 - subtotal gastrectomy?
 - vagotomy with gastro-enterostomy or pyloroplasty?
- Perforated duodenal ulcer
 - simple closure?
 - subtotal gastrectomy?
 - non-operative treatment?
- Hemorrhage from esophageal varices
 - balloon tamponade?
 - trans-esophageal ligation?
 - gastric resection?
 - portal decompression?
 - splenectomy?
- Hemorrhage from gastro-duodenal ulcer
 - direct suture control?
 - subtotal gastrectomy?
- Appendicitis with generalized peritonitis
 - non-operative management?
 - early operation?

- Regional ileitis
 - ileocolostomy with exclusion?
 - resection?
- Peptic esophagitis
 - (see further comments on this section)
- Colon obstruction
 - cecostomy?
 - transverse colostomy?
- Carcinoma of rectosigmoid
 - abdomino-perineal resection?
 - anterior resection?
 - left colectomy?
- Carcinoma of the breast
 - radical mastectomy?
- Metastatic carcinoma of breast
 - oophorectomy?
 - adrenalectomy?
 - hormonal treatment?
 - role of radiation?
- Papillary carcinoma of thyroid
 - local excision?
 - radical excision?
- Carcinoma of the cervix
 - irradiation?
 - radical operation?
- Intussusception
 - surgery?
 - reduction by barium enema?
- Cancer of the lip and mouth
 - neck dissection?
- Parotid tumor
 - total or subtotal excision of the gland?
- Burns
 - treatment by exposure?
 - treatment by pressure dressings?
- Malignant melanoma
 - how radical should surgery be?
- Penetrating wounds of the heart
 - open operation?
 - pericardial aspiration?
- Thromboendarteritis of the lower aorta
 - resection and graft?
 - by-pass?
 - thrombo-endarterectomy?

The section on peptic esophagitis is illustrative. The problem is introduced by Friesen. There is general agreement as to what is known of etiology. Operative repair of otherwise uncomplicated hiatus hernia is acceptable. But for the more advanced case with severe pain, esophagitis leading to ulceration, stricture and shortening of the esophagus, methods differ.

Merendino resects the lower diseased esophagus and interposes a 15 cm. jejunal segment, does a bilateral vagotomy, and a Finney pyloroplasty.

"Eighty-seven patients with various infections of the skin were treated over a period of six weeks with [Signemycin]. Excellent or good results were achieved in sixty-seven, including eleven of twenty-two patients refractory to other antibiotics."

Lewis, H. H.; Frumess, G. M., and Henschel, E. J.: *Rocky Mountain M. J.* 54:806 (Aug.) 1957.

"Results of treatment with oleandomycin-tetracycline of 50 infections [mostly respiratory] due to resistant organisms and 40 infections [respiratory, skin, urinary infections] due to sensitive organisms are very encouraging. In some of these patients, [Signemycin] was lifesaving, and in others surgery was made unnecessary. This confirms other reports."

Shubin, H.: *Antibiotic Med. & Clin. Therapy* 4:174 (March) 1957.

Based on case reports documented by independent investigators in 26 countries abroad, the clinical response obtained with Signemycin in 1404 patients with a wide variety of infections was successful in 1329 patients; in 13 cases only was it necessary to discontinue therapy because of side effects.

Report on 1404 Cases Treated with Signemycin: Medical Department,

Pfizer International. Available on request.

In 50 nonselected patients, Signemycin "...appears to be effective in the treatment of most general surgical infections, including virulent staphylococcus aureus infections. In some cases these infections had been clinically resistant to other antibiotics. The drug is apparently well tolerated."

Levi, W. M., and Kredel, F. E.: *J. South Carolina M. A.* 53:178 (May) 1957.

Of 50 patients with various infectious processes, 26 had not responded to previous antibiotic therapy. With Signemycin "Ninety-six per cent of the mixed infections were clinically controlled. . . . and in none of the cases was there any reason to discontinue the drug."

Winton, S. S., and Chesrow, E.: *Antibiotics Annual 1956-1957*, New York, Medical Encyclopedia, Inc., 1957, p. 55.

Signemycin in 79 patients with severe soft tissue infections: "The average response of these cases was excellent and inflammatory symptoms subsided with almost uniform rapidity.... The magnitude and incidence of surgical intervention was reduced.... Side reactions were minimal. . . ."

LaCaille, R. A., and Prigot, A.: *Antibiotics Annual 1956-1957*, New York, Medical Encyclopedia, Inc., 1957, p. 67.

Five groups of patients (total 211) with acne were treated with one of five antibiotic agents, including Signemycin (55 cases). "The results were evaluated taking into consideration the usual response to such conservative conventional therapy and the rapidity of response." In 8 weeks, Signemycin rapidly attained and maintained the highest percentage of efficacy of antibiotic agents tried.

Frank, L., and Stritzler, C.: *Antibiotic Med. & Clin. Therapy* 4:419 (July) 1957.

In the treatment of 78 patients with tropical infections, some complicated by multiple bacterial contamination or present for years, Signemycin was found to be "...an exceptionally effective agent," requiring smaller doses and less extended periods of therapy than with the tetracyclines alone, and "caused no notable toxic reactions."

Loughlin, E. H., and Mullin, W. G.: *Antibiotics Annual 1956-1957*, New York, Medical Encyclopedia, Inc., 1957, p. 63.

MYCIN[†]

OLEANDOMYCIN TETRACYCLINE-PHOSPHATE BUFFERED

PROVED CLINICALLY EFFECTIVE

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When specifying
buffered Signemycin V
be sure to write the
V on your Rx

Ellis excises the diseased esophagus along with a segment of gastric cardia plus resection of the antrum and does esophago-gastrostomy and gastroduodenostomy plus vagotomy.

Watkins treats the unstrictured esophagus by "esophagofundopexy" which restores the angle of entrance by suturing "the top of the greater curvature to the side of the lower esophagus." For the stenotic lesions he resects the lower esophagus, does a proximal subtotal gastrectomy and interposes a segment of colon.

Lischer and Burford take note of the interposition procedures but believe they are for the most part unnecessary. Sixteen cases are reported as treated by Finney pyloroplasty alone—all with marked benefit. They add that this procedure is simple, safe, and (if inadequate) permits of later interposition if desirable.

The book is not one of surgical technic, per se, and there are few illustrations. Rather it is a panel-type review of surgical problems with sufficient reference to technic to make clear the principles of treatment advocated by the proponent. The editors are to be congratulated on having presented such a work in a manner that is most attractive and rewarding to the practicing surgeon. It is a book, once opened, that is difficult to lay aside.—*T.P.B.*

From Sterility to Fertility. By Elliot E. Philipp. Published by Philosophical Library, New York. 118 pages. Price \$4.75.

Elliot E. Philipp, an English physician, has written this book for couples showing difficulty producing a pregnancy.

The book begins with a definition of infertility and a discussion of its incidence and a listing of those couples that should seek help in their problem. The next portion deals rather completely with the various disorders of the male and female pertaining to infertility. Following this is a description of some of the more complicated diagnostic and therapeutic procedures used, including the various aspects and types of artificial insemination. The last chapter is concerned entirely with the many problems of adoption.

The book is written in a style that is informative and yet simple enough that no couple should have difficulty understanding it. I feel it has accomplished its purpose of showing husbands and wives what a complete infertility study consists of and the reasons for the many questions and tests. It also helps them to better judge the competency of the physician conducting the study.

There is no section on normal physiology of reproduction which I feel should be included in a text of this type. Also, many of the legal aspects mentioned concerning adoption and artificial insemination in England may be different from those in the United States.

I feel that the book achieves its purpose quite well but not as well as a book of a similar nature by Hamblen.—*R.G.H.*

Hormonal Regulation of Energy Metabolism. Compiled and edited by Laurance W. Kinsell. Published by Charles C Thomas, 1957. 242 pages. Price \$5.25.

This book is a record of the Proceedings of the Conference on Hormonal Regulation of Energy Metabolism, edited by Dr. Kinsell and containing contributions by 28 authorities in this field. The subjects treated are carbohydrate metabolism, hormonal regulation of enzymatic activity, the anterior pituitary, pituitary growth hormone thyroid, insulin, and the adrenal cortex.

Each subject is introduced by a presentation outlining the contributor's work in the field, followed by ample discussion by the other members present so that the controversial nature of the subject matter is amply covered.

The difficult problem of any relationship between hormones and enzyme systems is well discussed. The book contains a goodly number of illustrations and tables for a publication of this type. It is to be recommended for the internist as a good review of current thinking on this subject and also for the research worker in the fields of endocrinology or enzymology.—*R.E.B.*

It Pays to Be Healthy. By Robert Collier Page. Published by Prentice-Hall, Inc., New York City. 285 pages. Price \$4.95.

This personal health guide suffers from some confusion in presentation, since it is directed both at administrators as individuals with problems of their own and at the same time as a guide for their administrative conduct and technics. It seems obviously more applicable and useful for industrial employers than for self-employed individuals. There is a need for greater efforts to "accentuate the positive."

The author may be over confident about the abilities of individuals to perform self analysis of their life stresses and reactions. Perhaps there is too great reliance on the abilities of an individual with a

for certain disorders of menstruation and pregnancy

TRULY EFFECTIVE PROGESTATIONAL THERAPY

BY MOUTH

NORLUTIN

(norethindrone, Parke-Davis)

oral progestogen
with
unexcelled potency
and
unsurpassed efficacy

Now, with small oral doses of this new and distinctive progestogen, you can produce the clinical effects of injected progesterone. In amenorrheic women for example, "As little as 50 mg. of [NORLUTIN] administered in divided doses over a five-day period was sufficient to induce withdrawal bleeding."¹

CASE SUMMARY²

Amenorrhea of 4 years' duration in a 24-year-old married woman. A course of 10 mg. NORLUTIN twice daily for 5 days was followed after 3 days by menses lasting about 5 days. Since no spontaneous menstruation occurred during the following 35 days, she was given another course of treatment with NORLUTIN, 10 mg. twice daily for 5 days. This was followed by menses.

When this patient was given ethisterone, 40 mg. twice daily for 5 days, no bleeding had ensued when she was seen 41 days later.

INDICATIONS FOR NORLUTIN: conditions involving deficiency of progestogen such as primary and secondary amenorrhea, menstrual irregularity, functional uterine bleeding, endocrine infertility, habitual abortion, threatened abortion, premenstrual tension, and dysmenorrhea.

PACKAGING: 5-mg. scored tablets (C. T. No. 882), bottles of 30.

REFERENCES: (1) Greenblatt, R. B.: *J. Clin. Endocrinol.* 16:869, 1956. (2) Hertz, R.; Waite, J. H., & Thomas, L. B.: *Proc. Soc. Exper. Biol. & Med.* 91:418, 1956.



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DETROIT 32, MICHIGAN

functional illness to be logical, rather than emotional, about such analysis.

In spite of these doubts, this book will, doubtless, be quite helpful to executives by increasing their understanding of psychosomatic ills. It is hoped that they will not become too confident of their abilities to do it themselves, rather than consulting with a practicing physician or psychiatrist.—*T.R.H.*

Science Looks at Smoking. By Eric Northrup. Published by G. P. Putnam's Sons, New York City. 190 pages. Price \$3.00.

This book, written by a lay science and technical writer, presents the pros and cons of the various common concepts of the effects of smoking upon health. The introduction, written by a prominent pathologist, lends a scientific and authoritative approach. The book is written for the most part in simple lay terms and attempts to present the various so-called scientific data upon which the present claims linking cigarette smoking with lung cancer and heart disease are based.

There is a brief review of what knowledge we now have of cancer and its behavior; of experimental methods used to try to link cancer and coronary artery disease with exposure to tobacco; and experimental work using other agents and factors than tobacco to demonstrate cause and effect relationship with cancer and coronary artery disease. The statistical data quoted in the incrimination of tobacco are shown to be full of loopholes and without proof of anything. All evidence to support the theories that tobacco causes these and other diseases is shown to be circumstantial, unscientific, and without experimental or clinical proof. The personal feelings of individuals condemning cigarettes and other forms of tobacco are emphasized as important factors which bias their acceptance of unscientific data to "prove" their points.

Historically it is shown that attempts to legislate against the use of tobacco have occurred since the days of King James I in 1604. Former tobacco phobias have blamed the culprit as the cause of epilepsy, insanity, blindness, syphilis, dwarfism, tuberculosis, and other conditions.

Mr. Northrup attempts to point out that smoking became an integral part of the behavior of Europeans from the time Columbus introduced tobacco to the Spanish court and that personal pleasures derived from smoking, the boon of the industry in the economy, and other factors outweigh the present day case against tobacco.—*R M.B.*

A.M.A. Civil Defense Meeting

The 8th annual County Medical Societies Civil Defense Conference was held November 9-10 at Chicago's Morrison Hotel. Sponsored by the A.M.A. Council on National Defense, the conference is designed to help local medical and health personnel plan their roles in disaster and civil defense emergencies.

Congresswoman Martha W. Griffiths of Michigan reported on the status of national civil defense legislation which received considerable attention during the first session of the 85th Congress. Mrs. Griffiths is a member of the House Committee on Government Operations and its Subcommittee on Military Operations.

Another highlight of the conference was a study of experience gained through several test operational exercises conducted under simulated disaster conditions, including a critique of the national exercise "Operation Alert."

Additional reports were given on such subjects as general preparedness planning, hospital operational preparedness, the role of the county medical society, radiological aspects of radiation fallout, the A.M.A.-F.C.D.A. study project, the A.M.A. program on Asian influenza. The group also broke up into small sections to discuss specific problems.

A.M.A. Committees to Meet

Two committees of the A.M.A. Council on Medical Service plan regional meetings Monday, December 2, in Philadelphia just prior to the A.M.A.'s 11th clinical session.

The Committee on Maternal and Child Care will have its first regional meeting on perinatal mortality and morbidity. Invitations are being sent to members of maternal and child care committees in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia.

The Committee on Aging announces its third regional conference for members of state committees on aging. Subjects to be discussed include physical examinations and a health maintenance program, guides for the organization and operation of medical society committees on aging, medical education in caring for the aged, preretirement counseling, and special research programs of a medical school.

Physicians interested in attending either of these sessions should contact the council for further details.

New Chemotherapy

INDICATIONS:

- Rheumatoid arthritis, acute or chronic
—with or without adjunctive therapy.
- Spondylitis
- Arthritis associated with lupus
erythematosus or psoriasis

HOW SUPPLIED:

Aralen phosphate: 250 mg. tablets in bottles of 100 and 1000.
125 mg. tablets in bottles of 100.

Tolerance:

Aralen is usually well tolerated. Toxic effects are usually mild and to date have been transitory in nature, disappearing completely either on continuance or cessation of therapy or on reduction in dosage.

Gastrointestinal disturbances (e.g. nausea, rarely vomiting, diarrhea, abdominal cramps, anorexia) are frequent manifestations of intolerance. Temporary blurring of vision (due to interference with accommodation) is also relatively frequent.

Pleomorphic skin eruptions (e.g. lichenoid, maculopapular, purpuric), although generally mild, may preclude the use of an optimum dosage schedule. If a skin reaction persists on a reduced dosage schedule, or recurs after reinstitution of treatment with gradually increasing doses, discontinue Aralen till the lesion again disappears and consider resuming treatment with Plaquenil® (brand of hydroxychloroquine).

Less frequently transitory vertigo, headache, lassitude, or neurological disturbances, such as nervousness, irritability, emotional change, and nightmares have been reported. Instances of unexplained slight gradual weight loss as the patient's general health and arthritic condition improved have been mentioned. Occasional instances of bleaching (depigmentation) of the hair have been described.

Although an occasional instance of leukopenia, with normal differential count, has been reported (WBC about 3000), it has not proved troublesome because it has always been reversible on discontinuance, or diminution of the dose. Even spontaneous reversal may occur while full dosage is maintained.

THEORY OF ACTION:

Aralen appears to suppress or induce remission of rheumatoid inflammatory processes by inhibiting adenosinetriphosphatase.

Caution:

Aralen is known to concentrate in the liver and, although hepatic damage has never been reported, the drug should be used with caution in the presence of liver disease. In the presence of severe gastrointestinal, neurological, or blood disorders, the drug should be used with caution or not at all. If such disorders occur during the course of therapy, the drug should be discontinued. Concomitant use of gold or phenylbutazone with Aralen should be avoided because of the tendency of these agents to produce drug dermatitis.

Clinical Comments:

Of fifty patients receiving Aralen therapy, "43 have become really well; that is, they have no stiffness, and any pain that occurs can reasonably be attributed to use of joints affected by secondary degenerative changes. They have no evidence of joint inflammation, but may have a raised erythrocyte sedimentation rate. They have little or no need for analgesics."

Freedman³

"One hundred and twenty-five private patients have been carefully followed clinically and haematologically while receiving well over 200 patient-years of chloroquine [Aralen] therapy. The results are considered good in 70%, one-half of these cases being in remission. Improved work performance, sedimentation rate, and hemoglobin levels paralleled the major objective gain in this 70%. 90% of them remained on chloroquine [Aralen] therapy, half for more than two years. Classical peripheral rheumatoid arthritis, spondylitis, arthritis of juvenile onset, and rheumatoid disease with psoriasis, all appeared to respond about equally well.

"It is suggested that chloroquine comes closer to the ideal for long-term, safe, control of rheumatoid disease than any other agent now available."

Bagnall⁴

"Out of the 36 rheumatoid arthritis cases we treated . . . favorable results were obtained in 32 cases."

Bruckner et al.⁵

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Winthrop

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COUNTY SOCIETIES

Dr. Barrett A. Nelson, Manhattan, president of the Kansas Medical Society, was a guest of the Sedgwick County Society at its first fall meeting in Wichita, October 8. The scientific program included three presentations: "Bone Sterilization with Cobalt," Dr. Carl K. Zacharias; "The Influence of Diet on the Healing of Fractures," Dr. Solomon Leyva, and "Infant Asphyxiation," Dr. Archibald Tetzlaff.

Members of the Cloud County Medical Society were hosts to the Golden Belt Medical Society at a meeting held at the Concordia Country Club on October 10. Dr. Samuel Zelman, Topeka, spoke on "Liver Function Tests" and Dr. C. D. Bell, Lincoln, Nebraska, discussed "Dermatology in General Practice." A business session followed the dinner meeting.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was speaker at the October meeting of the Leavenworth County Society. His topic was "The Future of the Community Hospital." Guests at the meeting were wives of members, representatives of the hospital board of directors, and administrators.

Physicians of the First District, at the call of the councilor, Dr. Emerson D. Yoder, Denton, held a dinner meeting at the Atchison Community Hospital on October 22. Members of the Auxiliary were present for dinner, after which the groups separated. Dr. Barrett A. Nelson, Manhattan, and Dr. Yoder addressed the physicians, discussing the new healing arts act, indigent care in Kansas, and other topics of current medical interest.

The regular meeting of the Wyandotte County Society was held in Kansas City on October 15. Dr. Francis T. Collins, Topeka, president of Kansas Blue Shield, was guest speaker, having as his topic "Blue Shield versus Commercial Carriers."

A system of priorities for distribution of Asian flu vaccine was adopted by the Cowley County Society at a recent meeting in Arkansas City. Speaker at the meeting was Dr. William H. Fritzemeier, Wichita.

Dr. George I. Curran, of the University of Kansas Medical Center, spoke on "Inhibitions of Cholesterol Synthesis in Man—A New Approach to the Problem of Atherosclerosis" at the October 7 meeting of the Shawnee County Society in Topeka.

Medical Education Week in April

The third annual Medical Education Week, nationwide tribute to the progress of American medical schools, will be promoted during the fourth week in April by medical schools and the medical profession.

April 20-26 will be devoted to an all-out effort to create a greater understanding among the public of both the achievements and the problems of medical schools. Each of the sponsoring organizations—the American Medical Association, the Student American Medical Association, the Woman's Auxiliary to the A.M.A., the Association of American Medical Colleges, the American Medical Education Foundation, and the National Fund for Medical Education—is asking its membership to reserve this week for community and statewide salutes to area medical schools.

Local and state programs will be reinforced by national publicity through network television and radio, newspaper syndicates, and magazines. In addition, sponsors will send promotional aids to their state and county officers to help in local observances.

During the 1957 Medical Education Week, medical societies in 32 states and woman's auxiliaries in 42 states planned various activities, and their past successes are expected to lead to an even more widespread acknowledgment of the achievements of medical schools in 1958.

Help for Medical Assistants' Groups

A new how-to-do-it organizational manual for medical assistants was introduced at the second national convention of the American Association of Medical Assistants in San Francisco, October 4-6. Edited by leaders in assistants' groups around the country, the manual is being published by the A.M.A.'s Public Relations Department. The manual, titled "Take-off Techniques," discusses such organizational processes as securing medical society cooperation, planning educational programs, and keeping members informed.

This is the second publication for medical assistants the A.M.A. has prepared this fall. A new packet, outlining medical assistants' organizational aims and activities, was completed recently and is available on request to medical societies and assistants' groups.

It is estimated that for every dollar spent by vocational rehabilitation agencies, \$10 is returned in taxes to the government during the working life of the person helped. A study on the subject was recently made by the Massachusetts Division of Vocational Rehabilitation.

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Heart Disease Statistics

More Americans than ever before are now living long enough to die from heart disease.

This point is made in a statistical report on heart disease published recently by Health Information Foundation in its monthly bulletin, *Progress in Health Services*.

Disorders of the heart, blood vessels and related organs, the Foundation pointed out, caused over 850,000 deaths last year—more than half the total number of deaths in this country. In 1925 these diseases caused only about one-third of all deaths, and in 1900, only one-fifth.

In a sense, said Foundation President George Bugbee, the increasing prominence of heart disorders "is a reflection of medical progress. With many once-feared infectious diseases now under control, more Americans are living to an age where they are more likely to become subject to heart disease and other degenerative disorders."

An estimated five million Americans have heart disease, and another five million suffer from related disorders such as high blood pressure (hypertension), hardening of the arteries (arteriosclerosis), cerebral hemorrhage, rheumatic fever, and chronic nephritis (kidney disease).

"Substantial progress," the Foundation said, "has been made against premature death from many forms of heart disease, notably conditions of infectious origin—rheumatic and syphilitic heart disease, subacute bacterial endocarditis, etc. Surgery, drugs and special diets have been effective in certain cases of hypertension. But coronary heart disease remains a major unsolved problem."

Deaths from heart diseases alone have increased 60 per cent since 1900 and now account for 360 fatalities per 100,000 population, or nearly two-fifths of all deaths. More than ever, heart disease has become an affliction of old age, the Foundation said. About 70 per cent of all deaths from this cause occur after the age of 65.

Although disability from heart disease is apparently more prevalent among women, it causes more deaths among men. In fact, 75 per cent more men than women died from heart disease in 1955, as opposed to 15 per cent more in 1900. The disparity is highest between the ages of 35 and 49.

One frequently-stated explanation for this puzzling trend is that "men are thought to be particularly subject to and perhaps particularly vulnerable to strains and pressures of modern life, factors presumed to be important in causing the disease."

Commenting on current efforts to discover a preventive or cure for heart disease, Mr. Bugbee stated: "Coronary heart disease apparently flourishes where

living conditions are highest, diets richest and psychological pressures heaviest—in other words, in the type of environment that seems to typify modern America. . . .

"The complexity of heart disease, the many disorders to which it is related, the long-term investigations needed before it can be better understood—all show that the road ahead may be a long one. . . . The public should realize that even more funds are needed for added research in this field."

The public has another role as well, he added. The American Heart Association, he said, advises that "some forms of heart disease can be prevented and a few can be cured. Almost all cases can be helped by proper treatment, especially if started at an early stage."

Mr. Bugbee concluded: "Thus, while the public support of group activities for research and for better medical and hospital care is vital, each person has an individual responsibility to use present medical knowledge in his own behalf—not only when illness strikes, but in time of apparent good health as well."

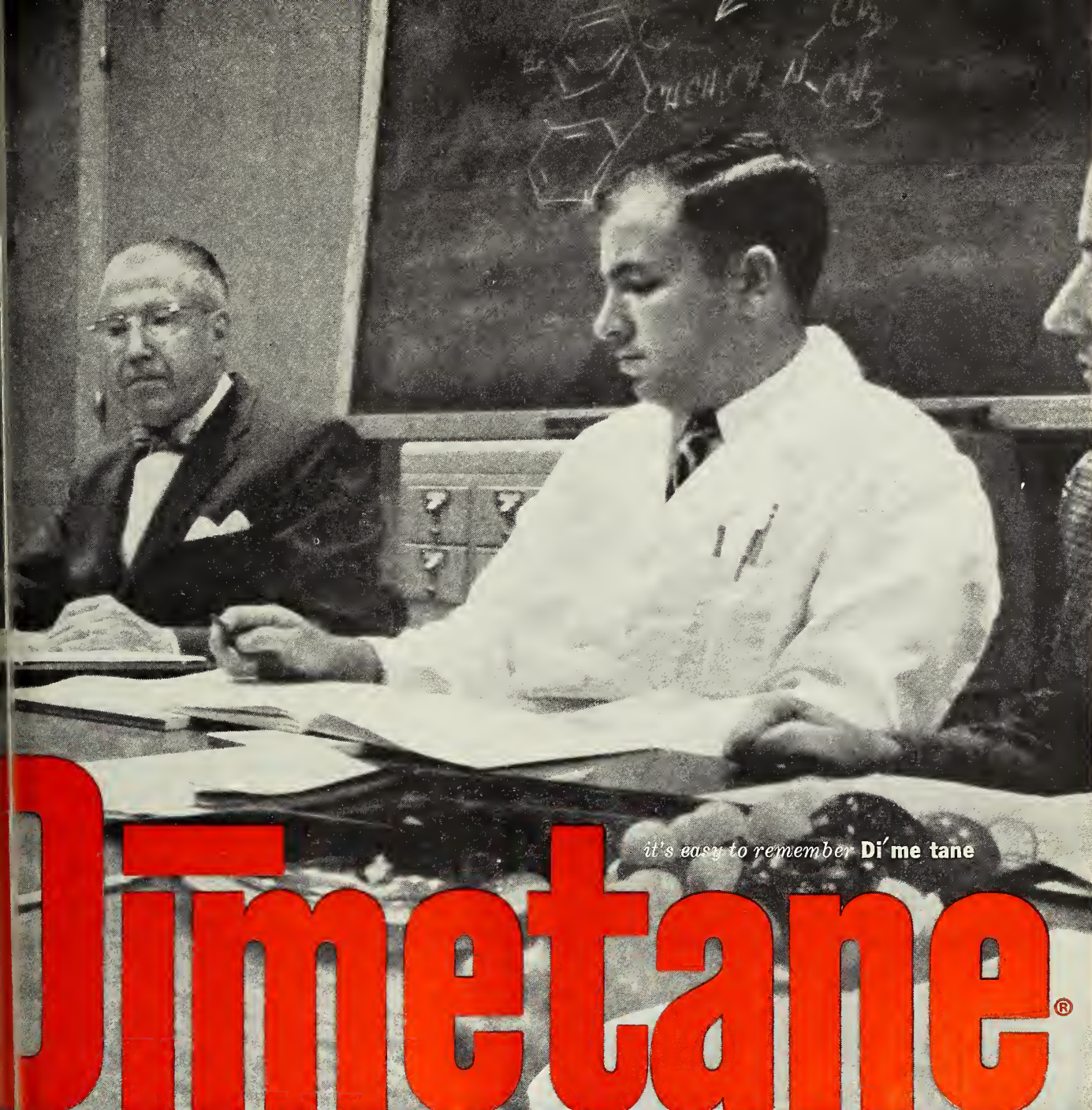
Cancer Film Bookings

Hope in the thought that 75,000 lives in America need not be lost needlessly to cancer each year is the theme of a dramatic educational film recently added to the A.M.A. Film Library. Titled "The Other City," the film stresses the encouraging fact that doctors currently are saving one in three patients as compared with a previous one-in-four ratio. Setting of the film is Racine, Wisconsin. Four basic thoughts are developed: (1) Racine empty and lifeless; (2) a symbolic representation of what cancer is; (3) how the 75,000 inhabitants of this token city could have helped save themselves, and (4) Racine alive and bustling.

Produced by the American Cancer Society, the 16-mm. color film runs 22 minutes and 30 seconds. It is suitable for showings on local television as well as for church, club, and school gatherings. Medical societies may book the film through the A.M.A. Film Library.

"Any traffic offense so serious it calls for a fine over \$100 rates a jail sentence," says Judge R. A. Pfaff of Los Angeles. "Nobody ought to be allowed to buy that kind of driving."

During the past two years, Americans have bought Savings Bonds at a pace that is exceeded only by the World War II years.



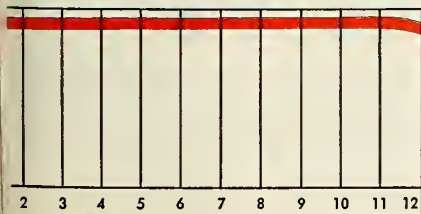
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Periods of stress can be easily handled with supplementary DIMETANE Tablets or Elixir to obtain maximum coverage.

Dosage:

Adults—One or two 4-mg. tabs.
or two to four teaspoonfuls
Elixir, three or four times daily.
One Extentab q.8-12 h.
or twice daily.
Children over 6—One tab.
or two teaspoonfuls Elixir t.i.d.
or q.i.d., or one Extentab q.12h.
Children 3-6—½ tab.
or one teaspoonful Elixir t.i.d.

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Medical Education Congress

Problems confronting medical education in the rapidly changing scene will be the main topic of concern at the 54th annual Congress on Medical Education and Licensure, February 9-11. Sponsored by the A.M.A. Council on Medical Education and Hospitals, the Federation of State Medical Boards of the United States, and the Advisory Board for Medical Specialties, the congress will be held at the Palmer House, Chicago.

The conferees will view medical education's broad potential in the light of four factors—the changing characteristics of the nation's population, sociological trends, economy, and medical knowledge—and the implications of these factors on medical education, medical research, and medical care.

In addition, four workshop committees, composed of representatives from the A.M.A., the Council, the A.A.M.C., higher education, government, business, insurance, labor, and agriculture, will discuss various problem areas, endeavor to clarify questions that need to be raised, and recommend possible ways for medicine to assume leadership in solving these problems. The committees' reports will be presented before the entire congress for discussion from the floor.

On Monday morning, February 10, the council will conduct its annual co-sponsored meeting with the Advisory Board. This session will be devoted principally to discussions of problems in graduate medical education created by the changing status of the patient and the role of the community hospital in graduate medical education. The federation will hold its second examination institute on Saturday,

February 8, and its regular meeting on Tuesday, February 11.

The habit of saving is a joint effort of husband and wife in 59 per cent of American families, a recent survey concludes.

In a Palo Alto traffic court, offenders are confronted with a large sign reading: "Things we know without being told:

- "1. You were not going that fast.
 - "2. You are a careful driver.
 - "3. The officer did not pace you.
 - "4. The fast ones got away.
 - "5. You favor law enforcement, *but . . .*
- "So tell us again. We love it."

Historical Material Needed

In preparation for the observance of The Kansas Medical Society's centennial anniversary, members of the Committee on History are attempting to collect all material of historical interest. Physicians who can contribute information, records, etc., are urged to send such to

Committee on History
Kansas Medical Society
315 West 4th Street
Topeka, Kansas

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WILL SELL OR LEASE one-story, five-room brick building, office of deceased physician in small town, east central Kansas. Stock of drugs and office equipment for sale. Write the Journal 5-57.

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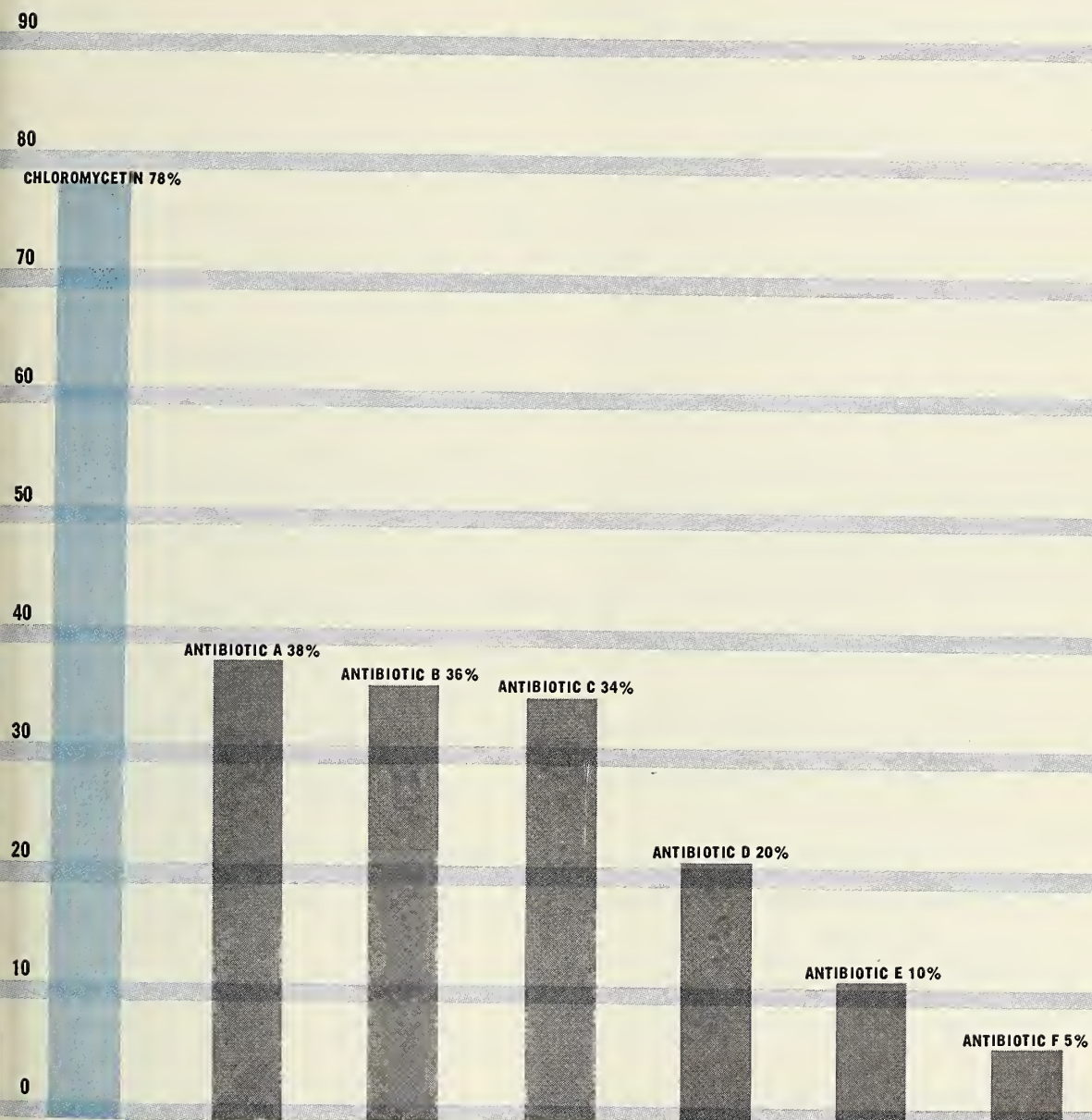
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**COMPARATIVE SENSITIVITY OF MIXED *PROTEUS* SPECIES TO CHLOROMYCETIN
AND SIX OTHER WIDELY USED ANTIBIOTIC AGENTS***



*This graph is adapted from Waisbren and Strelitzer.¹⁵ It represents *in vitro* data obtained with clinical material isolated between the years 1951 and 1956. Inhibitory concentrations, ranging from 3 to 25 mcg. per ml., were selected on the basis of usual clinical sensitivity.

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Volume LVIII

DECEMBER, 1957

No. 12

Carcinoma of the Thyroid

Incidence in Surgically Removed Nodular Thyroid Gland

PAUL T. McGANNON, M.D., *and*
FRANK F. ALLBRITTEN, JR., M.D., *Kansas City*

Wide variations in the reported incidence of carcinoma in nodular goiters and changing indications for thyroid surgery, resulting from general acceptance of radioactive iodine in the treatment of toxic thyroid disease, have focused considerable attention on the thyroid nodule as a surgical lesion. Surgeons, internists, and pathologists have disagreed in the last decade as to whether the incidence of carcinoma in thyroid nodules reported in numerous statistical reviews is real or apparent. From this, however, have come certain facts which have influenced surgical thinking in respect to this disease.

1. The incidence of carcinoma in thyroid nodules in adolescents and young adults is sufficiently high to warrant routine surgical extirpation of these lesions.

2. Men have a three to one greater chance of having carcinoma in the thyroid nodule than do women. Thyroid nodules in men should be removed without hesitation.

3. Further, solitary nodules prove to be malignant far more frequently than do multinodular lesions and for this reason should be removed.

There remains, however, disagreement concerning the actual incidence of carcinoma of the thyroid in the general population. Cole⁷ has emphasized that carcinoma of the thyroid must in some way be related to hyperplasia and that hyperplasia of the thyroid is a geographical disease. He has reported with surpris-

ing consistency a cancer incidence of 17.1 per cent in nodular goiters removed from patients in two separate series collected from an endemic goiter area.

Crile,⁸ in an excellent review of the subject, has sighted the absurdities in various series when applied to the general population. He indicates that if the high incidence is applied to "a Great Lakes city like Cleveland with 1,000,000 inhabitants, 50,000 of whom have clinically detectable nodule in the thyroid gland, there would be at least 4,000 people walking the streets with thyroid cancer."

Sokal,⁵ in an autopsy series, reports an incidence of 0.56 per cent.

This is a review of experience with a referred hospital population with nodular goiters which were surgically removed. In this group, 14 patients had lesions removed which were malignant and unsuspected clinically, an incidence of 8.9 per cent of all patients with nodular goiter treated by removal. This factor can be applied to the general population. If cancer cannot be recognized clinically in two-thirds of referred patients who are subsequently proved to have it, then the incidence of cancer is sufficiently high in all referred patients with thyroid nodules to warrant removal of such nodules.

From the Department of Surgery, University of Kansas Medical Center, Kansas City 12, Kansas.

Cole⁷ points out the fallacy of this type study, since 11 of 17 thyroid cancer patients in his study expired without having post mortem examination. Crile⁹ has stated that statistics on the subject are unreliable because they are based on a selected group of patients whose goiters are removed. Other reports both confirm and deny the above contentions.

Table I illustrates the variation found in reported incidence of carcinoma in nontoxic nodular goiter. These groups were selected to show geographical variation as well as the variation that exists between larger and smaller institutions. These differences probably arise from selection of patients, geographical location, interest of the physician concerned, and the number of hospital admissions throughout the year.

Continued interest in nodular goiter and conflicting reports have prompted us to review our experience with the surgical treatment of 171 patients with nodular goiter during a ten-year period. The report includes an analysis of the clinical records of all patients having nodular lesions of the thyroid removed from 1940 through 1950 at the University of Kansas Medical Center. Patients with diffuse goiter were not included in this study.

Material

Patients were admitted to the Medical Center Surgical Service in one of three ways: referred from the family physician, referred from the Medical Service, or referred from an outpatient department of the university hospital. In the majority of instances the patient had been aware of the presence of a nodule or nodules for some time. Patients were referred because of symptoms of toxicity, continued growth of the lesion, cosmetic reasons, or symptoms of tracheal irritation. In general it may be said that two-thirds of the patients who were advised to have

Table J
REPORTED INCIDENCE OF CARCINOMA
in
NON-TOXIC NODULAR GOITER IN RECENT YEARS

| AUTHOR | LOCATION | NO. CASES | NUMBER CARCINOMA | PER CENT | YEAR |
|---------------------|--------------------|-----------|---------------------|----------|------|
| Miller | Michigan | 435 | 16 | 3.7 | 1955 |
| Beal | California | 133 | 15 | 11.2 | 1952 |
| Watt- Foushee | Georgia | 222 | 6 | 1.7 | 1951 |
| Kearns- Davis | Illinois | 101 | 17 | 11. | 1952 |
| Cole | Illinois | 285 | 47 | 17.1 | 1949 |
| Cloud- Branch | Illinois | 291 | 47 | 5.8 | 1955 |
| Colcack | Massachu- setts | 748 | 76 | 10.8 | 1952 |
| Pemberton- Black | Minnesota | 5,679 | 220 | 4.8 | 1951 |

Table II
INCIDENCE OF CARCINOMA IN TOXIC & NON-TOXIC
NODULAR GOITER

| | Number of Cases | Number with Carcinoma | Per Cent Carcinoma |
|--------------------------------------|--------------------|--------------------------|-----------------------|
| Nodular Goiter (Toxic & Nontoxic) | 171 | 23 | 13.4 |
| Solitary | 78 | 13 | 16.6 |
| Multinodular | 93 | 10 | 10.7 |

surgical removal had symptoms referable to the thyroid gland, while one-third were referred because of the fear of malignant change in the thyroid gland.

Geographical Distribution

There were 120 patients from Kansas, 49 from Missouri, and one each from Oklahoma and Colorado. Rural and urban population is represented in about equal numbers—from an area of farming and industrial communities in a non-endemic goiter region.

Sex, Age, Race

Women predominate in a ratio of 8:1 with an average age for the group of 46 years. The youngest patient was 15; the oldest was 79 years. There were 16 colored patients.

Results

Seventy-eight nodules were described as solitary at the operating table by the surgeon, while 93 multiple nodules were found (Table II). In 15 instances an error in diagnosis was made in which solitary nodules were found to be multiple. In the solitary nodular group carcinoma was present in 13 instances, an

Table III
INCIDENCE OF UNSUSPECTED CARCINOMA IN TOXIC
& NONTXIC NODULAR GOITER

| | Number Cases | Carcinoma Unsuspected | Per Cent Unsuspected |
|--------------------------------------|-----------------|--------------------------|-------------------------|
| Nodular Goiter (Toxic & Nontoxic) | 171 | 14 | 8.6 |
| Solitary | 78 | 8 | 10. |
| Multinodular | 93 | 6 | 6. |

Table IV
INCIDENCE OF CARCINOMA IN MALES

| | Number Cases | Number with Carcinoma | Per Cent Carcinoma |
|-----------------------------------|--------------|-----------------------|--------------------|
| Nodular Gaiter (Toxic & Nontoxic) | 19 | 8 | 42 |
| Salitary | 11 | 5 | |
| Multinodular | 8 | 3 | |

incidence of 16.6 per cent, while malignant change was present in 10 of 93 multinodular glands for an incidence of 10.7 per cent. The total number of carcinomas in the entire series of 171 patients was 23 for an incidence of 13.4 per cent.

A rather striking finding was the incidence of unsuspected carcinoma of the thyroid gland (Table III). Nine patients in the group of 23 with carcinoma had frank malignancies or were suspected clinically of having malignancies preoperatively. Fourteen patients of the total of 23 found to have carcinoma had no detectable evidence of carcinoma preceding operation.

In the male group, which is small, there were 11 solitary nodules in 19 patients (Table IV); the rest were multinodular. Five of 11 male patients with solitary nodules in the thyroid gland had carcinoma, and three of eight patients with multiple nodules had cancer. More than one-third of this small group of patients had carcinoma, suggesting, as shown by others, that a man has a significantly greater chance of having malignant change in a thyroid nodule than does a woman.

There were 15 carcinomas in 152 women patients with an incidence of 9.2 per cent. Four were present in 67 solitary nodules; 11 in 85 multinodular goiters (Table V).

The average age of those patients with carcinoma was 51 years. The youngest was 22, the oldest was 72 years of age.

Table V
INCIDENCE OF CARCINOMA IN WOMEN

| | Number Cases | Number with Carcinoma | Per Cent Carcinoma |
|-----------------------------------|--------------|-----------------------|--------------------|
| Nodular Gaiter (Toxic & Nontoxic) | 152 | 15 | 9.8 |
| Solitary | 67 | 4 | 5.9 |
| Multinodular | 85 | 11 | 12.9 |

Symptoms and Duration

When the symptoms of those patients with benign nodular goiter are compared with those in whom malignancy was present, there are no significant differences that would lead the examiner to make the correct diagnosis preoperatively. While rapid growth was a presenting complaint in many patients with malignancy, it was also a consistent complaint of those with benign lesions. Hoarseness was present in both groups. Consistency of nodules was not reliable in determining the presence of neoplasm in this experience. Thus soft lesions as well as hard ones were subsequently found to be malignant. The lesions ranged in size from 2 cm. to 22 cm., and no correlation between size and neoplastic change could be made.

Solitary benign lesions were present an average of seven years (Table VI). The longest duration was 49 years, the shortest three weeks. Multiple nodules ranged in duration from six weeks to 40 years with an average of 11 years. In contrast, malignant solitary nodules were present 33 months on the average; the shortest period was two months, the longest eight years. Multinodular goiter showing malignant changes was present for an average time twice that of solitary nodules, about 17 years. The longest duration was 55 years, the shortest one year. Fifty-six per cent of patients in both groups had noticed the presence of nodules five years or less. Indeed, there is no known consistent finding by which early carcinoma residing in a nodular goiter can be predicted. This is further emphasized in this study, since carcinoma of the thyroid gland was unsuspected in 14 of 23 patients, or 60 per cent of instances, when the specimen was in the surgeon's hand at the operating table.

Clinical hyperthyroidism, using the criteria of tumor, tremor, tachycardia, and elevated metabolic rate, was found in 29 of 171, or 16 per cent of the patients. Two of these patients had carcinoma.

There were two hospital deaths in 171 patients, a mortality of 1.1 per cent.

Table VI
DURATION OF LESIONS IN YEARS

| Type of Lesion | No. Cases | Duration | Average |
|----------------------------|-----------|-------------------|-----------|
| Benign Solitary Nodule | 65 | 3 wks. to 49 yrs. | 7.9 Years |
| Benign Multinodular | 83 | 6 wks. to 40 yrs. | 11 Years |
| Malignant Solitary Nodules | 13 | 2 mos. to 8 yrs. | 33 Months |
| Malignant Multinodular | 10 | 1 yr. to 55 yrs. | 17 Years |

Table VII
OPERATIONS PERFORMED FOR BENIGN NODULAR GOITER

| | Solitary-No. Cases | Multinodular No. Cases |
|------------------------|--------------------|------------------------|
| Excision | 37 | 6 |
| Partial Lobectomy | 7 | 3 |
| Total Lobectomy | 12 | 8 |
| Subtotal Thyroidectomy | 9 | 64 |
| Total Thyroidectomy | 0 | 2 |
| TOTAL | 65 | 83 |

Surgical Procedure

Table VII illustrates the extent of surgical removal carried out in the group and compares the procedure in solitary lesions with that used for multiple lesions. In the group of patients with solitary nodules, 37 lesions were removed by simple excision. Seven were removed by partial lobectomy, 12 by total lobectomy with removal of the isthmus, and nine by subtotal thyroidectomy. Sixty-four in the multinodular group had subtotal thyroidectomy, with the other procedures as listed in Table VII.

It is interesting to compare Table VII with Table VIII, which lists the extent of the removal of malignant lesions. Two of nine pre-operatively recognized carcinomas were biopsied only because of local invasion or distant metastasis. Both were in the multinodular group. In patients with solitary thyroid nodules, three nodules containing carcinoma were excised, five were treated with total lobectomy to include the isthmus, four had sub-total thyroidectomy, and one had a total thyroidectomy with radical neck dissection. Multinodular malignancies were handled similarly, one treated by local excision, three had subtotal thyroidectomy, three had total thyroidectomy, and one patient had a total thyroidectomy with radical neck dissection. This again illustrates that inadequate removal is often carried out because the surgeon is unaware that a nodule is malignant. All of the patients found to have a neoplasm were subsequently treated with irradiation.

Table VIII shows the variation in pathological diagnosis in this group and compares the diagnosis in solitary nodules with that of multinodular lesions. In the group of 78 patients with solitary nodules, 54 had colloid or pseudo adenoma; 10 had fetal adenomas; one struma lymphomatosa; the remaining were papillary adenocarcinoma, angiofibrosarcoma, and malignant fetal adenoma. In the multinodular group,

60 had adenomatous hyperplasia, one or more fetal adenoma, 12 thyroiditis. Of the remaining number, eight had papillary adenocarcinoma and two anaplastic carcinoma.

Follow-up

An attempt has been made to follow those patients with benign as well as malignant thyroid nodules. In the group with benign lesions removed, 104 of 148 patients have been followed. Only one patient had a recurrent nodule after local excision of the first lesion, and this has not been surgically treated. The remaining 103 patients have had no evidence of further nodular thyroid disease.

Nineteen of 23 patients with malignant thyroid nodules have been followed (Table X). Of the 19 patients with cancer who were followed, six were suspected of having cancer preoperatively. Only one of the six survived. Of the 13 who were not suspected of having cancer, five survived 5 to 15 years without evidence of recurrence, two died of nonrelated intercurrent disease, and six died of cancer. This significant difference occurred in spite of the limited type of removal practiced during the period under consideration.

In the group of survivors, five had papillary adenocarcinoma and one malignant fetal adenoma; in those not surviving, ten had papillary adenocarcinoma, two angiofibrosarcoma, and one anaplastic carcinoma.

Discussion

In the present study one is reviewing experience with a referred hospital population with nodular goiters which were surgically removed. In this group, each of 14 patients had a lesion removed which was malignant and unsuspected clinically, an incidence of 8.9 per cent of all patients with

Table VIII
OPERATIONS PERFORMED FOR MALIGNANT NODULAR GOITER

| | Solitary No. Cases | Multinodular No. Cases |
|---|--------------------|------------------------|
| Biopsy | | 2 |
| Excision | 3 | 1 |
| Lobectomy | 5 | |
| Subtotal Thyroidectomy | 4 | 3 |
| Total Thyroidectomy | | 3 |
| Total Thyroidectomy & Radical Neck Dissection | 1 | 1 |
| TOTAL | 13 | 10 |

nodular goiter treated by removal. This factor is significant and can be applied to the general population. If cancer cannot be recognized clinically in two-thirds of referred patients who are subsequently proved to have it, then the incidence of cancer is sufficiently high in all referred patients with thyroid nodules to warrant their removal.

This study has confirmed the findings of others in regard to the particular high incidence in young adults and males. To this can be added the high incidence of carcinoma in multinodular goiter.

It can be concluded that the incidence of carcinoma is sufficiently high in both nodular and multinodular glands to warrant the routine surgical extirpation of these lesions.

Summary

1. Experience with surgical treatment of 171 patients with nodular goiter treated at the University of Kansas Medical Center from 1940 through 1950 has been reported.

2. Twenty-three of 171 patients having single or multiple nodules in the thyroid gland had malignant lesions, an incidence of 13.4 per cent.

3. Fourteen patients in the group of 23 with malignant lesions did not have clinical evidence of malignant disease, an incidence of unsuspected cancer of 8.6 per cent in the entire group of patients with solitary or multiple nodules in the thyroid gland.

4. Cancer was found in eight of 19 male patients, an incidence of 42 per cent.

5. The incidence of carcinoma in 152 female patients with nodular goiter was 9.2 per cent.

6. Carcinoma was present in a higher percentage in solitary nodules than in multinodular glands, the former 16.6 per cent and the latter 10.7 per cent. This difference is not so great as that indicated in other reports.

Table IX
PATHOLOGICAL DIAGNOSIS IN 171 CASES

| SOLITARY | No. Cases | MULTINODULAR | No. Cases |
|--------------------------|-----------|--------------------------|-----------|
| Colloid Adenoma | 54 | Adenomatous Hyperplasia | 60 |
| Fetal Adenoma | 10 | Fetal Adenomas | 11 |
| Struma Lymphomatosa | 1 | Thyroiditis | 12 |
| Papillary Adenocarcinoma | 10 | Papillary Adenocarcinoma | 8 |
| Malignant Fetal Adenoma | 1 | Anaplastic Carcinoma | 2 |
| Angiofibrosarcoma | 2 | | |
| TOTAL | 78 | TOTAL | 93 |

Table X
SURVIVAL TIME OF PATIENTS WITH THYROID CARCINOMA

| | | SURVIVAL YEARS | |
|-----------------------------------|----|----------------|---------|
| | | RANGE | AVERAGE |
| Total No. Patients with Carcinoma | 23 | | |
| No. Living & Well | 6 | 5-15 | 7.4 |
| No. Dead of Inter-current Disease | 2 | 6-7 | 6.5 |
| No. Dead of Metastasis | 11 | 1-8 | 2.7 |
| No. Lost to Follow-up | 4 | | |

7. Duration, size, and symptoms of lesions in no way separated benign from malignant lesions.

8. Six of 19 patients with carcinoma are alive five to 15 years after surgery for a five-year survival rate of 31.6 per cent.

9. It is concluded that the incidence of carcinoma in nodular lesions of the thyroid is sufficiently high in comparison with the existing mortality rates that all nodules of the thyroid gland should be removed.

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Anomalies of the Esophagus

Congenital Esophageal Atresia and Tracheo-Esophageal Fistula

RUSSELL A. NELSON, M.D., *Wichita*

In the last decade the diagnosis of tracheo-esophageal fistula has increased about five-fold. Congenital anomalies of the esophagus are reported with about the same frequency (1:800 births) as hare-lip and cleft palate in the Boston area, while the occurrence is only 1:10,000 births in the Philadelphia region.

During the last six years, seven newborns with anomalies of the trachea and esophagus, or roughly one per year, have been seen at Wesley Hospital. Of these, one infant survived. There is still much room for improvement in the index of suspicion of this anomaly so that an earlier diagnosis can be made.

The accompanying chart summarizes the cases seen at Wesley Hospital (Table I).

A résumé of the normal embryology and pathological variants of the esophagus and trachea aids in a fuller understanding of this unique lesion, tracheo-esophageal fistula.

The esophagus rises from the out-pouching of the retropharynx and the pregastric area. Septation from the trachea occurs from an infolding of lateral furrows which join caudally and then progress cranially until the trachea and esophagus are separated.

According to the most widely accepted theories, anomalies and especially tracheo-esophageal fistula occur for the following reasons:

1. Failure of pharyngeal and gastric out-pouchings to unite or establish a satisfactory lumen.

2. A mechanical developmental deviation of the

Seven cases of tracheal anomalies and esophageal fistula are reported with a single surviving case. Symptomatology always revealed profuse mucus and regurgitation. Earlier diagnosis and surgery and better supportive treatment would increase the number of survivors.

septum between the esophagus and trachea, or altered cellular growth along the septum. Absence of growth resulting in fistula and deficient growth of entodermal cells in the dorsal wall of the foregut result in atresia.

3. These deviations may result from changes in tension by the heart anlage. Persistence of an aberrant subclavian artery, right sided aortic arch, or a caudal remnant of the dorsal aorta may interfere with esophageal recanalization, either by direct compression or by causing deviation of the septum, both of which result later in fistula formation due to pressure atrophy. A delay in differentiation of the ar-

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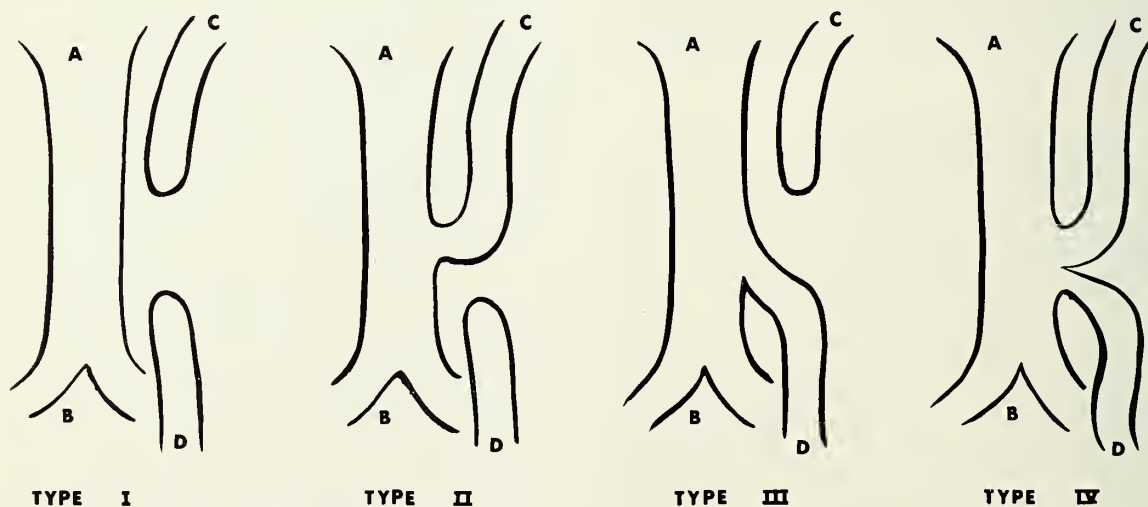


Figure 1. Diagrammatic sketches illustrating the most common type of tracheo-esophageal fistulae. A—upper trachea; B—bifurcation of trachea; C—upper esophagus; D—lower esophagus.

TABLE I
TRACHEO-ESOPHAGEAL FISTULA CASES, WESLEY HOSPITAL, WICHITA, KANSAS

| Case No. | Sex and Race | Birth Date and Weight | Died | Symptoms | X-ray | Treatment | Necropsy |
|--------------|--------------|-------------------------------|--------------------|--|--|--|---|
| I (R-9164) | female white | 8-31-49 7 lbs., 4 oz. | 9-7-49 7 days | mucus, unable to feed rhonchi in chest | coiled tube upper esophagus 2nd day | 3rd day anastomosis esophagus | breakdown of suture line |
| II (S-9464) | female white | 5-3-50 5 lbs., 6 oz. | 5-8-50 5 days | mucus, large amounts vomiting all feedings dehydration, fever | 60-70% collapse rt. lung, diagnosis on second day | 2nd day anastomosis esophagus | emphyema, pneumonia right lung |
| III (T-2493) | male white | 7-9-50 4 lbs., 12 oz. | 7-11-50 2 days | mucus, vomiting all feed- ings, unable to pass gastric tube | small bowel obstruction imperforate anus | anastomosis small bowel and colostomy | absent upper esophagus lobular pneumonia, small bowel anastomosis, colos- tomy, imperforate anus |
| IV (W-4954) | male white | 4-25-52 5 lbs., 3½ oz. | 4-27-52 2 days | profuse mucus, periodic cyanosis, worse after feed- ings, improved after suction | incomplete expansion RUL, retained secre- tions in lower bron- chial segments | 2 bronchoscopies | T-E Fistula, right lung |
| V (Z-556) | male white | 9-4-53 6 lbs., 1¼ oz. | 9-21-53 17 days | large amounts mucus, worse after fluids offered, cyanosis, dyspnea and vomiting | T-E Fistula dextrocardia | 5th day anastomosis esophagus | pneumonia, dextrocardia, breakdown fistula repair |
| VI (18185) | male white | 2-25-55 7 lbs., 13½ oz. | living | excessive mucus, vomiting of feedings, poor color after feedings | coiled catheter T-E Fistula | 2nd day anastomosis esophagus enterostomy 11th day | survival |
| VII (33316) | male white | 12-9-55 4 lbs., 14 oz. | 12-15-55 6 days | excessive mucus, cyanosis dyspnea and unable to feed | pneumonia both U.L. 4th day T-E Fistula | 5th day feeding enterostomy. 6th day anastomosis esophagus | pneumonia, interstitial rt. aortic arch lung hemorrhage 3 chamber heart. |

terial system may also account for the stricture when no abnormal vessel is found. If recanalization occurs when the vascular arches are too far craniad to interfere with esophageal development, no abnormal vessels will be found. The comparative sizes of the vessels in 13 mm. or 4- to 6-week stage are not the same as those at birth.

Graphic illustrations show best the types of abnormal connections or lack of connections in this region of the body (Figure 1).

Ninety-five per cent of esophageal anomalies communicate with the trachea in some manner.

The type of abnormal connection determines some of the symptoms. In Types I and II no connection exists between the lower or pregastric portion of the esophagus, and the trachea or upper esophagus, and a scaphoid abdomen and absence of intestinal gas pattern in the x-ray are found. In Types II and IV the upper esophageal segment ends in a pouch which empties into the trachea. The child usually drowns or dies rapidly from aspiration pneumonia when the first feeding is taken. These types account for less than 10 per cent of the total cases. Type III constitutes approximately 90 per cent of the cases. The upper segment ends in a sacculated pouch 2-4 cm. below the epiglottis at the level of the second dorsal vertebra. The lower segment arises from either the trachea or one of the bronchi.

The distal portion (seen in the following lateral view) has a considerably smaller lumen and arises from the lower end of the trachea about one centimeter above the bifurcation. The opening is usually (as shown in the A-P view) in the midline on the posterior wall. The esophagus widens as it descends and is of normal caliber when it enters the stomach. Small dehiscences in the septum usually are not diag-

nosed until repeated bouts of unexplained pneumonia have occurred. Partial esophageal stenosis is usually found later when solid foods are introduced into the diet.

Symptomatology in the newborn has one outstanding and constant feature, excessive saliva or mucus. This accumulates in the upper pouch whether the infant is fed or not fed.

The upper pouch becomes distended before birth from intrauterine swallowing of amniotic contents. This leads to distention of the pouch which, if extensive, may cause pressure in the trachea with consequent dyspnea. Usually regurgitation follows almost immediately after the first food or fluid is given. If it is food, the food is returned undigested. The first swallowing may be normal in some infants, but eventually dysphagia and finally complete inability to swallow occurs.

Even on the absence of feeding, vomiting may start or continue from regurgitation of stomach contents. This may contain bile. In some cases the vomitus may contain blood. The loss of mucus and vomitus results in rapid weight loss.

Chest signs are those of atelectasis and pneumonia with rales, absence of breath sounds, and other signs, most commonly found in the right upper lobe. Due to a baby's supine position, infantile aspiration pneumonia involves the upper lobes of the lungs.

The abdomen may be distended if a communication exists between the trachea and the stomach.

X-ray findings are most outstanding when a catheter is introduced into the esophagus and found coiled in the upper pouch on an A-P view, or when a small amount of Lipiodol is instilled into the catheter to outline the pouch. Large amounts of Lipiodol increase the chance of aspiration pneumonia.

Bronchoscopy will not reveal the fistula but esophagoscopy (which can be done without anesthesia) will show the blind pouch. Slight dehiscences in

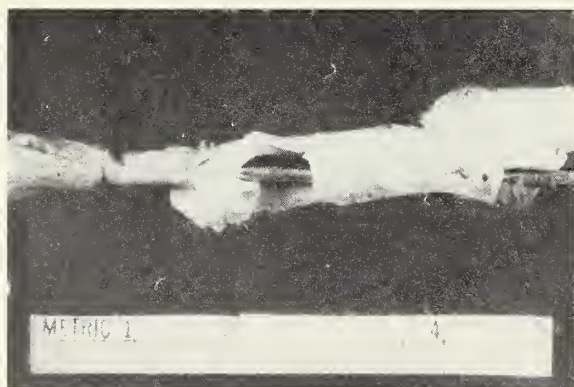


Figure 2. Lateral view of Case 4 (W-4954). The steel rod runs from the upper trachea down through the fistula and into the lower esophagus. The lateral view shows a posterior location of the upper esophageal sac.

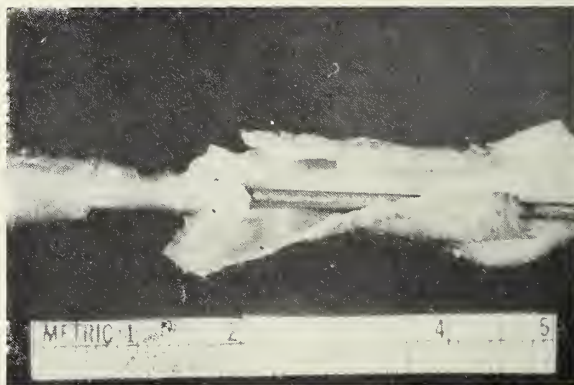


Figure 3. A-P view of Case 4 (W-4954).

the septum separating the esophagus and trachea are found only in this manner.

Pulmonary complications increase in proportion to the interval between birth and correction of the defect. Failure to close the fistula will result in the continued reflex of gastric contents into the lungs. The infant should not be fed by mouth until the defect is corrected, since this makes further aspiration likely. Also constant emptying of the upper pouch should be carried out by suction if a delay of surgery is necessary. Pneumonia should be treated with antibiotics. During this period other preoperative measures should include the insertion of an esophageal suction tube (usually made from a No. 8 French polyethylene catheter), and parenteral fluids for those lost by vomiting.

An infant who has lost fluids and taken in no food can be built up only by intravenous fluids including blood, plasma, amino acids, and vitamins. This is almost impossible without intravenous cannulization. No newborn should go through or to major surgery without cannulization of a vein. These infants should be placed in an oxygen tent because of the dyspnea which is usually present. Nursing care should be constant for emptying the upper esophageal pouch and maintaining the child in an upright position to prevent gastric regurgitation into the lower trachea.

Surgical treatment of tracheo-esophageal fistula has become a standard operative procedure during recent years. Gross stated that all cases should be corrected by primary esophageal anastomosis, usually followed by a feeding gastrostomy. At present, all cases at Boston Children's Hospital are operated upon by transpleural approach. In the year 1952, 67 per cent of the cases handled in this manner survived.

The procedure is not an emergency one and as much as 36 hours may be taken to treat pneumonia or other complications in order to improve the general condition of the patient before doing any operative procedure. Medical anesthesiologists are a necessity in such major surgery in a newborn. Both closed circuit tracheal intubation and close-fitting masks have been used for administration of the anesthetic agents.

Postoperative measures to aid in the recovery in these patients include pharyngeal suction, the use of oxygen in a tent, or preferably a device such as an Isolette to provide a moist oxygen, and continuation of antibiotics. Water intoxication from too vigorous a regime of parenteral fluids is as great a hazard after surgery as dehydration is before operation.

Oral feedings are not started before the tenth day. At first nutrition is maintained by intravenous therapy. This is followed after a few days by fluids offered through a plastic tubing passed into the stomach

at the time of surgery or by a gastrotomy. The latter procedure is simpler and safer in most hands.

Prognosis for the patient probably is determined by the amount of aspiration pneumonia present when the diagnosis is made and the size of the patient himself. Premature babies do not tolerate either the infection or the surgery well. Associated defects which are present in about one-third of such patients also lessen the likelihood of survival. These factors, along with the amount of dehydration and the type of anomalous connection, will determine the outcome of an individual case. If survival occurs, the possibility of tracheal or subglottic stenosis and esophageal stricture often arises.

If survival is to occur in these cases, prompt recognition and operation must come about. This can occur only when those who care for newborns are alert to the possibilities and pass a catheter into the stomach of any newborn who has excess mucus. If this is not possible, or if no gastric contents are obtained, a small amount of Lipiodol should be injected into the catheter and x-ray examination should be performed. All newborn infants with early aspiration pneumonia merit the same examination. Only in this manner can these cases be recognized before dehydration and pneumonia cause deterioration of the patient until he is a poor surgical risk.

Primary esophageal anastomosis is the first operation to be done on these children. Feeding enterostomy may be done immediately following this. These procedures are urgent but not emergencies. Some time can be spent on preoperative preparation of the patient to improve his general condition. This, along with meticulous postoperative care, should improve survival rates in a condition which is uniformly fatal without early diagnosis and prompt treatment.

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Cardiovascular Laboratory

Report of Activities at the University of Kansas Medical Center, May 1955 to May 1957

E. GREY DIMOND, M.D., Kansas City

The third two-year period of activity since the organization of the Cardiovascular Laboratory ended May 1957. The 1955-1957 period has been one of considerable development in the laboratory, and this third report is a summary of these activities. The report is divided into sections as follows:

Personnel: Staff, Residents, and Fellows
Hospital Service, Clinics, and Consultations
Diagnostic and Surgical Procedures
Research
Postgraduate Courses, Exhibitions, and Publications
Grants

Personnel: Staff, Residents, and Fellows

(A) Staff: Dr. E. Grey Dimond, Dr. James E. Crockett, and Dr. T. K. Lin have been the clinical staff of the Cardiovascular Laboratory. Dr. Crockett became a full time member of the laboratory in January of 1956. He is a graduate of the University of Kansas and completed his medical residency there. He was a clinical fellow in cardiovascular disease during the year preceding his joining the staff.

Dr. Kurt Reissmann continued as chief of the Experimental Medicine Section.

Dr. Santiago Grisolia headed the Enzyme Chemistry Unit, and Dr. George Curran continued his work in cholesterol metabolism. These two men are established investigators of the American Heart Association, and, with Dr. Reissmann, are responsible for the major basic research of the laboratory.

The cardiovascular surgeons have been Dr. Frank Allbritten, Dr. Creighton Hardin, and Dr. Frederick Kittle of the Department of Surgery. Dr. Antoni Diehl of the Department of Pediatrics has seen many of the pediatric heart patients. Dr. Robert Jordan guided the peripheral vascular work. These men, while not members of the staff of the Cardiovascular Laboratory, have continued to be responsible for important sections of the work.

The secretarial staff consisted of Kathryn Calderwood, Eleanor Lane, and Connie Leonard. Miss Calderwood was stolen from the laboratory by a

resident in medicine and is now Mrs. Roger Halliday. She had been with the laboratory for more than five years.

(B) Residents: Twelve medical residents rotated through the cardiovascular service during these two years for a period of four months each. The first two months are spent on the bed service. During the second two months a resident is responsible for the cardiac out-patient clinics and the daily interpretation of the electrocardiograms. The residents were: Doctors Thurl Andrews, Graham Calkins, Sami Duysak, Gordon Halliday, Roger Halliday, William Larsen, Francis Lohrenz, Clarence Pickard, William Ruth, William Shafer, Ronald Youmans, and Robert VanCitters.

This third report of the Cardiovascular Laboratory describes the activity of the laboratory personnel, residents, and fellows. It is also an account of the growth of the laboratory in services and facilities.

(C) Fellows: The fellowship program is divided between research and clinical cardiology, which includes participation on the cardiac catheterization team. Fellows in the cardiovascular laboratory for one year or longer have been: Dr. Sergio Cardoso, Rio de Janeiro, Brazil, Agnes Haskell Fellow; Dr. Thomas Cochran, University of Arkansas, National Heart Institute Trainee; Dr. Fethi Gonlubol, Smyrna, Turkey, Agnes Haskell Fellow; Dr. Alberto Guimpel, Rosario, Argentina, Agnes Haskell Fellow; Dr. Sherman Steinzeig, University of Kansas, National Heart Institute Trainee; and Dr. Joel Webster, University of Maryland, Research Fellow in the National Heart Institute.

Fellows for less than one year have been: Dr. Gordon Claypool, resident in medicine interested in the relationship of pressure studies of the hepatic vein wedge, the free hepatic vein, and the degree of cirrhosis of the liver by means of cardiac and hepatic

The author expresses appreciation to Herbertine Clark, B.S., for assistance in the preparation of this report.

catheterizations, University of Kansas; Dr. Roswith Lade, pediatrics resident, Mercy Hospital; Dr. Sheldon Pinsky, Eli Lilly Fellow; Dr. Lillia Rodriguez, Havana, Cuba, Agnes Haskell Fellow; and Dr. Nong Ting, National Defense Medical Center, Taiwan.

Hospital Service, Clinics, and Consultations

(A) Hospital Service: The laboratory continued to maintain an 11-bed hospital service with Dorothy Thomas, R.N., in charge. The dietitian was Delores Flackmiller, and the social service worker was Mildred Webb.

(B) Clinics: Clinics maintained by the cardiovascular laboratory were: angina clinic, held Thursday afternoon; peripheral vascular clinic, Thursday morning; general cardiology clinic, Monday and Friday mornings; pediatric heart clinic, Monday afternoon; and private out-patient days, Wednesday and Friday afternoons.

(C) Consultations: The total number of consultations by the cardiovascular staff was 4,770.

Diagnostic and Surgical Procedures

(A) Diagnostic Procedures:

1. Electrocardiograms: In this two-year period 18,421 electrocardiograms were recorded with direct writing equipment. During the 1953-1955 period, 14,569 electrocardiograms were taken. The technicians were: Ilah Plumb, Margaret Tessmann, Ruth Rider, Frances Siemens, Evelyn Hartkopp, Donna Sims, and Wanda McCann, under the direction of Margie Delich.

2. Basal Metabolism Rate: Eight hundred ninety-nine basal metabolic rates were done by Margie Delich, Ilah Plumb, Margaret Tessmann, and Ruth Rider.

3. Peripheral Vascular Studies: Dr. Robert Jordan and Dr. James E. Crockett supervised peripheral vascular work. They, with the residents in medicine and the fellows in cardiology, have seen 444 patients in the out-patient clinic during this two-year period. The attending chiropodist was again Dr. Irvine

Waxman. Peripheral vascular laboratory studies were conducted on 108 patients:

| | |
|---------------------------|----|
| Landis Studies | 55 |
| Oscillometrics | 31 |
| Intra-arterial Priscoline | 1 |
| Lumbar Block | 15 |
| Stellate Block | 8 |
| Skin Temperatures | 23 |
| Plethysmograph | 10 |

The technicians were: Lavina Goering, Betty Fry, Margie Allen, and Elizabeth Holladay.

4. Cardiac Catheterizations: Two hundred fifty cardiac catheterizations have been done. Two deaths occurred. One was a 1-year-old female who developed a nodal rhythm with a bundle branch block during catheterization. As her condition further deteriorated, the chest was opened and the heart was massaged. She developed ventricular fibrillation and the defibrillator was applied without result. Cardiac standstill, electrocardiographically, occurred 45 minutes after the nodal rhythm developed. The autopsy showed a typical endocardial fibroelastosis with main involvement of the left ventricle and auricle. The second death, in a 6-year-old male, was caused by an allergic reaction to 90 per cent hypaque, a radio-opaque agent. Signs of diffuse cerebral capillary damage became apparent a few hours after selective angiocardiology, and the patient expired 36 hours later.

In September 1955 the cardiac catheterization room was moved into new quarters to form a two-room cardiac catheterization suite. Much necessary remodeling and purchase of laboratory equipment was made possible with aid from the Lacy Haynes Fund. Equipment purchased included: several sections of stainless steel laboratory cabinets, a Collins chain-compensated gasometer for collection of expired air to calculate oxygen consumption and cardiac output, a Water's Oximeter, a North American Phillips Image Intensifier for selective angiocardiology, two P23D strain gages and amplifiers for more sensitive recording of intracardiac pressures, and a Brinkman Haemoreflexor to permit immediate analysis of samples of blood for oxygen saturation during the cardiac catheterization.

The cardiac catheterization laboratory has been the responsibility of Dr. T. K. Lin and Dr. James E. Crockett, and it comprises a large area of training for the fellows in cardiology. The technicians have been Donna Sims, Betty Fry, Maria Santos, Margie Allen, and Elizabeth Holladay, under the direction of Herbertine Clark.

5. Phonocardiograms: Three hundred forty-one

CARDIOVASCULAR LABORATORY
1951-1957

| | 1951- 1953 | 1953- 1955 | 1955- 1957 |
|--------------------------|---------------|---------------|---------------|
| Electrocardiograms | 13,546 | 14,569 | 18,421 |
| Cardiac Catheterizations | 130 | 244 | 250 |
| Operations | 130 | 231 | 234 |
| Phonocardiograms | | 120 | 341 |
| Fellows | 4 | 6 | 13 |

phonocardiograms were recorded with a Sanborn Twin-Beam Phonocardiograph during the two-year period. Dr. Sherman Steinzeig, Dr. Sergio Cardoso, Dr. Joel Webster, and Dr. Thurl Andrews recorded these tracings. They were assisted by technicians Lavina Goering, Betty Fry, and Margie Allen. A phonocardiography laboratory has been established with an adjoining dark room. The phonocardiography activities received a strong impetus from the efforts of Dr. Steinzeig. To gain initial information, Dr. Steinzeig spent several fruitful weeks at the laboratory of Dr. Aldo Luisada.

6. Ballistocardiograms: One hundred eighteen ballistocardiograms on patients, plus approximately 50 tracings on department employees (for a project to attempt to relate the Master's Two Step to the ballistocardiogram with ergotrate) were recorded. This work was done by Dr. Alberto Guimpel, Dr. Thomas Cochran, and Dr. James Crockett with an apparatus designed and built by Dr. Guimpel.

7. Aortograms: Twenty-four aortograms were done by Dr. Lin, Dr. Hardin, and Dr. Kittle.

8. Angiocardiograms: Twenty-one angiocardiograms were done by Dr. Diehl and Dr. Lin. They were aided in the aortography and angiocardiography by radiologists Dr. Galen Tice, Dr. Donald Gerrmann, and Dr. Karl Youngstrom. No deaths occurred because of these procedures, although one death following selective angio, described above, did occur.

(B) Surgical Procedures: Cardiovascular surgery was done by Dr. Frank Allbritten, Dr. Creighton Hardin, Dr. Frederick Kittle, and Ward Surgery Service, a service of advanced surgical residents under the supervision of a staff surgeon.

| | |
|---|----|
| 1. Aortic Graft | 34 |
| 2. Aortic Valvotomy | 12 |
| 3. Atrial Septal Defect Repair | 16 |
| 4. Coarctation of Aorta Resection | 14 |
| 5. Ductus Arteriosus Ligation | 3 |
| 6. Ductus Arteriosus Transection | 42 |
| 7. Exploratory Cardiotomy | 3 |
| 8. Hufnagel Valve Insertion | 3 |
| 9. Inferior Vena Cava Ligation | 5 |
| 10. Bilateral Internal Mammary Ligation | 6 |
| 11. Mitral Valvotomy | 58 |
| 12. Pericardial Poudrage | 7 |
| 13. Pott's Procedure | 5 |
| 14. Pulmonary Valvotomy | 15 |
| 15. Thoraco-lumbar Sympathectomy | 11 |

Research

(A) Dr. George L. Curran has been conducting studies on cholesterol metabolism in relation to atherosclerosis with especial attention to inhibition

of cholesterol biosynthesis in man. He has been assisted by Daniel L. Azarnoff, a U. S. Public Health Service Fellow.

(B) Dr. Santiago Grisolia, director of the McIlvaine Laboratories, has been working on phosphoglycerate metabolism (crystalline and highly purified 3-phosphoglyceric mutase has been obtained for the first time from yeast and skeletal muscle, and a comparative study of their properties has been conducted). Also he has been working on carbamyl metabolism with emphasis on the metabolism of pyrimidines, the metabolic effects on digitoxin, nucleotide deaminase, and diagnostic and therapeutic applications of the enzymes of the urea cycle.

Dr. Grisolia has trained, since the initiation of the McIlvaine Laboratory: Dr. V. W. Rodwell; U.S.P.H. post-doctorates Doctors J. C. Towne and D. P. Wallach; Dr. Sergio Cardoso, Haskell and Brazilian Conselho Nacional de Pesquisas Fellow; Dr. Vern Hospelhorn; and Dr. Robert Manning, a resident with a U.S.P.H. post-doctorate. Still receiving training are: Dr. Nobuo Ito, Japan; Miss J. Caravaca, Argentina; Dr. L. Mokrasch; and Miss B. Joyce.

(C) Dr. Kurt Reissmann has done work on the following: myocardial metabolism, hypothermia, erythropoiesis stimulating plasma factor, iron metabolism and intoxication, and glutamic oxalacetic transaminase.

His residents have been: Dr. Marvin Dunn, Dr. Jose Martins, Dr. William Ruth, Dr. Sherman Steinzeig, and Dr. Thomas Coleman. Dr. Reissmann's fellows have been: Dr. Sita Ram Kapoor, King George's College, Lucknow, India, Rockefeller Fellow; and Dr. Robert L. VanCitters, U.S.P.H. Research Fellow. Mary Ruth Dietrich and Myrle Kennedy have been the technicians.

(D) Research was also conducted upon the effect of ligation of the left anterior coronary artery in dogs by Dr. Dimond, Dr. Lin, and the cardiovascular fellows.

Postgraduate Courses, Exhibits, and Publications

(A) Postgraduate Courses: Five postgraduate courses were organized and conducted by the Cardiovascular Laboratory during the 1955 to 1957 period. The first was sponsored by the Kansas Heart Association, the Kansas City Heart Association, and the Kansas State Board of Health. It was *The Tenth Annual Heart Conference: A Symposium on Digitalis*, and the guest speakers were: Doctors Robert C. Batterman, Richard Bing, K. K. Chen, Bernard Lown, Aldo A. Luisada, and William A. Sodeman. Also, in the spring of 1956, the Cardiovascular Laboratory was host to the American College of Phy-

sicians Course, *The Heart: Recent Advances in Diagnosis and Treatment*. Guest instructors were: Doctors Claude S. Beck, Bernard L. Brofman, Ernest Craige, Willis Hurst, John S. LaDue, Lawrence Lamb, Gordon S. Myers, Janet Travell, Richard L. Varco, Edwin O. Wheeler, and Henry A. Zimmerman.

Three courses were given in the spring of 1957. One, *The Heart: Cardiac Arrhythmias*, was sponsored by the University of Kansas Medical Center in cooperation with the Kansas Medical Society and the Kansas State Board of Health. Guest instructors: Doctors Samuel Bellet, Herman K. Hellerstein, Calvin F. Kay, and Bruce Logue. Another course, *Electrocardiography*, and a third, *Cardiac Auscultation*, were given by the staff of the laboratory.

The total enrollment for these five courses was 444 physicians. In addition, two correspondence courses on *The Interpretation of Electrocardiograms* were conducted each year with a total enrollment of 445.

(B) Exhibits: Six exhibits were prepared. An exhibit on vector cardiography was shown at the Kansas City Southwest Clinical Society meeting in 1955. In 1956 an exhibit on aortography was prepared for the Kansas Medical Society. One on phonocardiography was shown to the Kansas City Southwest Clinical Society in 1956. A practical demonstration of electrocardiography was given during half-time at a benefit basketball game for the Kaw Valley Heart Association in February 1957. Phonocardiography was exhibited at the Kansas Medical Society meeting in 1957, and Tele-EKG was demonstrated at the National Tuberculosis Association meeting in 1957.

(C) Publications: These papers were published by the members of the laboratory from May 1955 to May 1957:

Azarnoff, D. L.; Curran, G. L., and Williamson, W. P.: Incorporation of Acetate-1-C¹⁴ into Cholesterol by Human Brain Tumors, *Fed. Proc.* 16:638, 1957.

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Lin, T. K., and Anache, Mario.: Right Heart Pressure Patterns in Constrictive Pericarditis, *Am. Ht. J.* 51:340, 1956.

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Manning, R., and Grisolia, S.: Serum Arginase, *Proc. Soc. Exp. Biol. & Med.* 95:225, 1957.

Reissmann, K. R., and VanCitters, R. L.: Oxygen Consumption and Mechanical Efficiency of the Hypothermic Heart, *J. Appl. Physiol.* 9:427, 1956.

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Grants

The medical school state budget funds provided the major support. The National Heart Institute was the main outside support through its yearly Undergraduate Cardiovascular Teaching Grants, and through the National Heart Institute Trainee Fellowships. Income from the Agnes Haskell Endowment also supported three fellows. The Kansas Heart Association contributed liberally, and a gift from the

Lacy Haynes estate permitted extensive remodeling of the cardiovascular section.

Dr. Curran received grants from the United States Public Health Service, the Kansas Heart Association, and the Grace Simmons Freeman Fund.

Dr. Grisolia's work was supported by grants from the Helen Hay Whitney Foundation, the United States Public Health Service, the Life Insurance Medical Research Fund, the Kansas Heart Association, and the American Heart Association. The McIlvaine Trust continued to be the major support.

Dr. Reissmann's section received grants from the United States Air Force, the United States Public Health Service, the American Heart Association, and the Kansas Heart Association.

Dr. Dimond received support from the Fulbright program as visiting professor to Holland in the winter in 1956 and was sponsored on a world trip by a Paul Dudley White Traveling Scholarship.

Social Welfare

A Study of Integration of Services in Kansas

FRANK LONG and GEORGE W. JACKSON, M.D., Topeka

On November 15, 1956, the Kansas Committee on Public Health and Welfare made its report to the Chairman of the Kansas Legislative Council dealing with several aspects of welfare administration. In this report, the Committee pointed out: ". . . the increasing interest of other states and of federal agencies in the various phases of both the Kansas welfare and institutional programs has come to the attention of your committee, and has served to encourage the committee to make this constructive report to the Council and to the people of the state of Kansas."

In another part of the report, the Committee said: ". . . it should be mentioned that in your Committee's opinion the county welfare departments have changed rapidly in the past several years from money-spending agencies to service agencies as well. The services performed by the county welfare departments are too numerous to mention here. However, it is quite apparent that the program is rapidly approaching the stage where any citizen of this state can secure help from the county welfare departments on most of the social problems that are plaguing this country today. The Committee members feel that in

a true sense the county welfare departments in cooperation with the State Department of Social Welfare are rapidly developing into practical family service units with emphasis on prevention and rehabilitation."

County Departments are service agencies! What does this mean? What services do counties perform? With whom do they cooperate? How do they perform these services? From where is the program administered? This article will try to answer these questions as simply as possible.

Enabling Structure

First, it is necessary to describe, briefly, the broad statutory authority given by the Kansas legislature

Careful dovetailing of services of local county public welfare departments with the programs and purposes of state agencies is producing superior services for the people of Kansas. The authors explain how cooperation is worked out between county departments and each of various state institutions and welfare services.

Reprinted from *Public Welfare*, April 1957. Mr. Long is director of social welfare and Dr. Jackson is director of institutions for the state of Kansas.

which has made possible the present system of integration. In 1949, legislation was passed providing for two divisions of the State Department of Social Welfare, the Division of Social Welfare and the Division of Institutional Management, both under the direction of a single administrator. In 1953, the legislature created the position of Director of Institutions, giving it the same administrative status as that of the Director of the Division of Social Welfare, thus creating two administrative officers appointed by and directly responsible to the State Board of Social Welfare. By the same act, the Director of the Division of Social Welfare was made Executive Secretary of the State Board of Social Welfare, thereby making him the directory agent between both divisions and the State Board.

At the present time, the Division of Institutional Management supervises the administration of 11 state eleemosynary institutions: three mental hospitals, two state training schools, two tuberculosis sanatoria, two industrial schools, one children's home and receiving home, and a psychiatric treatment center for children.

The Division of Social Welfare supervises the public assistance programs, child welfare services, services to the blind, licensing of adult boarding and nursing homes for the care of recipients of public assistance and patients who have received care at state hospitals and are in need of nursing care, staff development, commodity distribution, and operational service functions relating to finance, accounts and audits, research and statistics, personnel, and legal affairs.

One of the duties of the State Director of Social Welfare is the coordination of the various programs developed and supervised by the State Department, including the programs of the state institutions with the various county welfare agencies. In 1951 arrangements were made administratively on a state-wide basis for the local county agencies to cooperate with the state institutions by providing them preadmission social histories for persons committed or applying for admission to state hospitals. Arrangements were also made for the county agencies to assist the state hospitals and training schools on request in making placement plans for those patients ready to leave the institutions. Similar services for the state children's institutions had been voluntarily assumed by approximately one-third of the counties previously.

The Division of Child Welfare Services was responsible for the administration of all child welfare services, and the Division of Services for the Blind was administratively responsible for all services rendered by that program until 1953. In 1953, legislation amended the Welfare Act to provide for the administration of certain of these services by the local county

agencies under the supervision of the State Department. This resulted in the establishment of a Division of Field Services which became responsible for state supervision of all programs administered by the county agencies. Consultation services were provided by the various divisions to aid the state field service staff and the county agencies.

This change in administrative responsibilities from the state to local agencies and the integration of staff supervision made the need for staff training and development an urgent one, and resulted in the development of a Division of Staff Development. The director of this division, who is directly responsible to the State Director of Social Welfare, is charged with development of materials and programs that will aid in the training of both experienced and new welfare workers. To quote again from the report of the Committee on Health and Welfare: "In the past few years, the state and counties have developed a very effective integrated welfare program resulting in more efficient use of personnel and considerably more in the way of services and help to the state without materially increasing the staff personnel. The Committee notes that in order to enable the county welfare workers to take on the many added responsibilities assigned them, the State Department has initiated an effective staff development program. By the use of volunteer personnel from other state departments and many others, this program has developed training classes which are outstanding. The County Boards of Social Welfare and staffs deserve considerable credit for their close cooperation in this program."

Thus, the State of Kansas has a broad, comprehensive welfare program which provides not only financial assistance but a very wide range of services: from planning with an unmarried mother to assisting an aged person to secure adequate medical treatment and nursing care; from planning with the proper court and the relatives of an individual for care in a state institution to the studying of a foster home and assisting in placement plans for a small dependent child in a new permanent home.

Admission to Mental Institutions

The institutions for the mentally ill and the mentally retarded are regarded in Kansas as temporary resources to be used only at the time of the patient's need. This concept recognizes that hospitals and institutions are treatment facilities rather than mere custodial centers. It is also recognized that the patient who is to be admitted to an institution is a member of a community and, when possible, will be helped

to return to that community after his hospitalization. The principle that the patient is a human being with a varying capacity to respond to institutional treatment is continually borne in mind. This is the basis for defining the functions of the county departments of social welfare and the hospitals in relation to services to the patient.

Under the integrated program, the county agencies are charged with the responsibility of working with the patient and with his family in preadmission hospital planning. This includes, in addition to counseling and preparation of preadmission reports, social histories and financial reports. County agencies are also encouraged to work with a patient's family during his hospitalization and at the same time they are asked to help prepare the community for the acceptance of the patient upon his return from hospitalization. A closer look at the services the county departments perform in relation to admission policy will give a more accurate picture of integration.

Admission of patients to state institutions is of three types. Obviously, the first type is by commitment by a court of proper jurisdiction. Secondly, is the voluntary action of the patient himself. The third type of admission is one that merits some more detailed discussion. It is the "limited time referral" or, as it is called, the "ninety-day referral" by a court of proper jurisdiction. The purpose of this legislative authority is one that gives the court some leeway in requesting more valid information on the sanity of the person sought to be committed. It allows for more judicial determination on the adjudication of insanity by allowing the court to "refer" the person to a state mental institution for a period of 90 days. If, during this period, the institution's psychiatrists find that the individual is not legally insane, it may release the person to the court and give its recommendation. Conversely, if insanity is determined during the 90 day period, the institution informs the court of this finding and an adjudication is handed down. As a result of this, most of the persons admitted to an institution are not adjudicated insane at the time of admission. This is one method of assuring that only those patients who actually require extended institutional treatment become resident patients.

Role of County Departments

The State Board of Social Welfare has responsibility for receiving commitment orders from the court and for approving admissions when cleared by the Division of Institutional Management with the hospital superintendent. The county welfare departments' responsibility with respect to admissions is to provide upon request informational and referral

services. They are asked to secure information about individual cases as requested by the state hospital. The social service division of the state hospital will specify as fully as possible the information required and the sources of the information. Usually the individual request is one of three types: (1) Prior to admission of the patient an evaluation of his situation and that of the family for use in determining preferred order of admission; (2) Social history as an aid in diagnosis and treatment; (3) Supplementary social history when sources available to the hospital staff are unable to provide all the information required. By performing these services, the county departments take more responsibility in identifying those persons who need hospitalization and the institutions rely heavily on the recommendations of the county social worker.

Assistance in Screening

This screening service given by the county welfare departments is another assurance that only those who actually require institutional treatment are admitted to institutions. Not too many years ago, many patients who could have gotten along with out-patient treatment, or who did not need institutional care, were admitted to institutions and occupied a bed for a long period of time. However, this is not true now. For example, a minister recently referred one of his parishioners to a county director when the church member suddenly became unable to sign her name. This woman welcomed the social worker who visited her to tell her about treatment resources. She wanted the worker to help her secure out-patient treatment and she was able to follow the treatment and benefit from it.

In another instance, a partially sighted father was referred to the county agency by his doctor who suspected the man's illness called for psychiatric treatment. It was quite difficult for this man to see his need for a diagnostic evaluation at the out-patient department of the state hospital and it was also difficult for him to accept treatment. The county social worker followed closely the suggestions made by the psychiatric social worker in her efforts to give the patient the supportive case work help he needed while he continued in his employment during his course of out-patient treatment.

With more public understanding and more local community concern about the mentally ill, there is increasing public interest in early detection of emotional problems. Early detection of mental illness has become a cooperative community project and thus the public has some awareness of the early symptoms of disturbed behavior.

Community Participation

Frequently, county advisory committees and other volunteers demonstrate vital interest in mentally retarded persons. Citizens are often willing to give these patients simple employment and, in addition, they carefully supervise the patient in his employment activities. An example of this activity illustrates how the family, the local social agency, the institution, and the community cooperated to help a man become self-supporting and a contributory member of society. Bobby, age 21, was admitted to an institution for the mentally retarded in 1953. He was placed on summer leave to his father in June of 1956 and, subsequently was not asked to return to the institution in September when it was learned that his father was giving the support, guidance, and supervision which Bobby needed. In addition, Bobby is employed as a dishwasher at a local restaurant. His employer says that Bobby is a good boy who does satisfactory work. Bobby is pleased to be in his father's home again and there seems to be a pleasant relationship between father and son. It appears now that Bobby does not resent his father's supervision. The social worker has had interviews with Bobby's family, his employer, his neighbors and the probate judge. Each report was found favorable and it appears that Bobby is ready to become a permanent member of his community.

Assistance in Patient's Return

The county departments of social welfare participate with the hospitals in joint planning with the patient and his family for his return to the community and, when the need is indicated, the county supervises the patient's post-hospitalization.

When it is not possible for the patient to return to his family and it is necessary for him to go to a nursing home, county social workers are encouraged to bring nursing home administrators to the hospital to meet and to become acquainted with the patient. This usually makes the transition from hospital to the home easier for the patient because his possible fears of an unknown environment are somewhat alleviated, and because he feels wanted by the social worker and the administrator. Transition from a very sheltered hospital environment to a less sheltered nursing home environment is eased also by the very helpful social and medical information given to the nursing home administrator, who is thus prepared to understand the patient and to see him as an individual rather than as a statistic. The nursing home administrator knows the patient's eccentricities, his likes and dislikes, and is better able to make him

happy and comfortable and to help him in his readjustment. The administrator is further prepared to accept discharged patients by means of training courses offered at and by one of the mental hospitals. Nursing home administrators have enthusiastically accepted these extensive courses, and have remarked that they are extremely helpful in easing the intricate problems that are encountered in administering to discharged mental patients.

The formula used in Kansas for securing desirable social planning for a patient's return to his local community is relatively simple. It includes (1) intelligent leadership, (2) recognition of unmet needs for a patient's post-hospitalization, and (3) interest and action of the local citizens in meeting these needs. These positive factors have contributed much to better mental health programs in Kansas and have made the return of the mentally ill to their own communities a reality.

Improved social service through the expansion of staff in the hospitals and the splendid cooperation of the county welfare departments makes it possible for the hospitals to begin planning for the patient's release from the very day he is admitted to the hospital. With the hospital social service department and the county welfare departments working together as a team, the hospitals have been able to increase releases and to shorten the length of stay of the patients.

All of this adds up to the fact that in Kansas, mental patients go home. In 1947 there were 273 discharges from the three state mental hospitals. In 1956 there were 1,438 patients discharged. This shows, dramatically, that progress is being made towards reducing the overcrowded conditions which make it difficult to carry on an active treatment program. Yet, in this same period, admissions to mental hospitals increased 48.4 per cent! Much of the credit for this increase of both admissions and dismissals is due the county departments of social welfare.

Cooperation with Other Institutions

While this progress has been made in Kansas mental hospitals, the advances made by the other institutions are also worthy of note. The Boys' Industrial School and the Girls' Industrial School offer classwork, vocational training, and other programs for socialization. The delinquent children at these institutions receive intensive therapy. The county social workers are called upon to help with pre-parole reports, and supervision of the boys and girls when they leave the institution.

Kansas also has two institutions devoted to the care and cure of tuberculosis. The admission policy for these institutions provides that each county direc-

tor must make a statement as to the residence of the individual upon applying for hospitalization. In emergent cases which need immediate hospitalization, residency is not so important. However, the signature of the county director means that the director is alerted that this citizen from his community is going into a hospital and later may return to the community. In the meantime, the county social worker plans with the family and the community in preparing them for the return of the patient.

At the present time, over 1,200 children are being cared for by the State of Kansas through its Division of Institutional Management. Seven institutions care for children. All of these rely heavily on the services offered by the county social worker and by the Child Welfare Services Division. For example, the county social worker may find a boarding home for a child who leaves an institution.

To sum up this element of cooperation between the county departments and the institutions, an analogy may be helpful. One may think of the county departments as the left hand and the institutions' social service departments as the right hand. The head is the State Department of Social Welfare. This shows how it is imperative that the three work closely, cooperatively and happily together. For maximum efficiency each division needs the others.

The story of the Kansas plan of integration of services is not complete without the inclusion of some description of how the county departments cooperate with three other divisions of the Department of Social Welfare.

Until 1953, the Division of Services for the Blind was not one that relied upon county assistance in its administration. However, legislation in that year provided that the counties administer services for the blind under the supervision of the State Department. What did this increased responsibility of the county welfare department consist of insofar as eye problems and blindness are concerned? The Legislature simply said that "The county board shall provide services, subject to the rules and regulations of the state board of social welfare, for the prevention of blindness, the restoration of eyesight, and the rehabilitation of the blind." This broad direction was subsequently reduced to functional and procedural detail by the Division of Services for the Blind. Four general areas of activity and service were outlined as follows:

1. To become conversant with the problems associated with blindness and the resources available for meeting them.
2. Locate and maintain contact with all the blind and visually handicapped persons in the county.
 - (a) To maintain a county register.

- (b) To visit all registered blind persons at least once a year to evaluate their situation with particular respect to service needs.
3. To be alert to the needs among the blind and those with eye problems in the county—and to see that the needs are met:
 - (a) Through local resources such as civic groups and the case work efforts of the county staff.
 - (b) Through outside resources such as those provided by the Division of Services for the Blind.
4. To cooperate with Division of Services for the Blind in promoting the prevention of blindness within the county. (Glaucoma surveys, school screening projects, etc.)

County Departments' Role

With this broad, but definite assignment, the counties started to work. It was difficult at first because many of the problems peculiar to the blind were new problems to the county social worker. But through the Division of Staff Development, training sessions have been developed which have been very helpful in making the county worker more conversant with these peculiarities. Also, the Division of Services for the Blind has a number of trained home teachers in its employ. These teachers, themselves blind, are available in any part of the state to work with the blind person and the county worker. With all these positive factors added together, rehabilitation of blind persons has become more than a mere dream for many blind Kansans. A case example shows how rehabilitation can be effected:

Mrs. C., a 47-year-old housewife and mother, reacted to the onset of blindness with an almost complete withdrawal from activity and her responsibilities in the home. The county director made a referral to the home teacher who was greeted by the woman at her first visit with "I can do nothing, don't you understand? I can't see!" The blind home teacher used this opening to good advantage in first demonstrating to Mrs. C. that a blind person can do many things. Much counseling followed, and the social worker had a major part in this effort to help Mrs. C. realize that she need not consider herself helpless as a result of her blindness. Although Mrs. C. could have been taken to the Rehabilitation Center for the Blind for intensive training, she responded to home training so rapidly that this was found not necessary. Within a short time she began using the stove, adjusting the flame, and was soon preparing simple dishes. She was given lessons in foot travel. Her family was helped to understand that a blind person should be self-sufficient. Within two months after

the county worker's first visit, Mrs. C. was seriously considering dismissing the housekeeper she had employed for nearly three years.

This example is not at all unusual. The same story could apply to a man who has been taught a vocation and who has found active employment in jobs which are held by sighted persons as well. This man is thereby prevented from being dependent on the public assistance program and is instead an active and productive citizen of his community.

The County and Home Licensing

Another area of integration exists between the county departments and the Kansas Adult Licensing Program. The purpose of the licensing program is to secure for the aged, ill, and infirm of Kansas the kind of homes which will provide kind and considerate treatment and safe and sanitary facilities. A license issued by the State Department of Social Welfare certifies that a home meets requirements, and that the administrator of the home has agreed to provide protection and an environment that contributes to the happiness and well-being of those persons who reside there.

One function of the licensing program is to help the community plan for its older citizens. A basic premise in Kansas is that residents living in homes should be integrated insofar as possible into the mainstream of community life. This responsibility is a local one, and much of it falls on the county department. The State Department has employed a group worker to help in this area. The group worker cooperates with the county worker in helping the community discover its resources which apply to the persons who reside in licensed homes. The goal in each community is to see the program through to a point where the community can carry on with only occasional consultation. This obviously requires careful recruitment, orientation, and training of volunteers. The county worker and the group worker also cooperate in the training of the volunteers. The goal of the licensing program is the improvement of existing homes and the development of new and better homes. To attain this goal requires the continued cooperation of all administrators, all county agencies, and all interested citizens.

The County and Child Welfare Services

One more area of integration that merits consideration is that existing between the counties and the Child Welfare program. The objectives of the early planning for this program were broad and comprehensive, and projected far into the future. It was believed that with the establishment of county welfare departments, Kansas had the state and local welfare

structure necessary to make possible a well-rounded program of services to children. It was further recognized that if children of Kansas were to have a fair chance to develop into good citizens, protection and care must be made available in rural areas as well as in cities—a task challenging the best efforts of the state agency and each county agency.

Child Welfare services provided by the county welfare departments are many, but they can be generally broken down into these broad areas:

1. Casework services to children in their own homes.
2. Foster care services to children away from their own homes.
3. Social studies on adoptions for the Kansas probate courts.
4. Referral services for children having special needs which cannot be met in the county.
5. Work with courts in handling children's cases.
6. Services to children committed to Kansas institutions.
7. Services to unmarried mothers and children born out of wedlock.
8. Services requested by other counties or states.
9. Participating in and stimulating community activity regarding children.

In addition, the responsibilities of the counties were increased by an expansion of the licensing law. This provided for the licensing of children's boarding homes, day care homes, day nurseries, private institutions, child placement agencies, and maternity homes by the State Board of Health with the approval of the Division of Child Welfare Services or their designated county agencies. Thus, much of the licensing program falls on the shoulders of the county department which, in turn, cooperates with other agencies in determining the standards of a children's home.

Integration Proves Effective

Integration of services is not new. It is simply an expansion of the early pioneer's willingness to help his neighbor, knowing that his neighbor would in turn help him. Integration could just as well be spelled c-o-o-p-e-r-a-t-i-o-n, for the words are, as used in Kansas, one and the same thing. Bearing in mind the all-encompassing goals of any welfare department, it is felt that cooperation is the best way to help citizens become self-sufficient, productive members of their community. Through integration, it has been found that efficiency is increased when everyone pulls together. Because the county knows that it can rely on help from the various state-administered divisions, it is better able to offer more services, faster. Because

(Continued on Page 860)

PRESIDENT'S PAGE

DEAR DOCTOR:

It's December. The holidays approach. Half of our fiscal year has sped by. Any accomplishments? Yes, verily, plenty!

It behooves us to pause and sum up committee activities:

Prescott Thompson, Mental Health—A program to foster understanding of mental health problems. A series of JOURNAL articles on psychiatric situations in general practice. Promotion of mental health clinics. A contemplated manual. The perennial problems of commitment procedure, legislation, budgets for state institutions. Representation at the National Mental Health Conference.

G. E. Kassebaum, Medical Economics—The recently renegotiated group health and accident contract furnishing broader coverage without increase in premiums. Contemplated low cost accidental death benefits and comprehensive family coverage for long term disability up to \$10,000. Ere long a study of federal Social Security.

A. C. Armitage, Medical Assistants—Most successful educational clinics, excellent attendance, answers provided for scores of every day office problems.

Henry Blake, Woman's Auxiliary—Conferred with the ladies on slate and agenda; that organization the usual beehive of activity and unquestionably our most important public relations factor.

W. J. Reals, Fee Schedules—Tough problems. Established a definite policy, endorsed by the Council, specifically stipulating relationships with Blue Shield. Tackled fee schedules for the forthcoming Blue Shield comprehensive coverage plan. Working toward a relative fee schedule patterned after California's.

David Laury, Blue Shield Relations—More accomplished toward membership understanding of Blue Shield and closer plan relationship with the medical society than ever before. State and district committees built up by our industrious and resourceful Rueben Dalbec and Blue Shield's Tom Reed and started into effective operation.

Conrad Barnes, School Health—An active role in the Kansas City School Health Conference. Sent Dr. Jubelt to the national conference in Illinois where he contributed materially to the proceedings. Working for radical revision in attitudes toward school health problems, away, for example, from ill-advised slipshod group examinations and mass inoculations toward a realistic and intelligent approach. To this end, co-operative planning with educators and public health workers.

R. G. Heasty, Maternal Health—Ever an active group. Continued accomplishments toward lowering maternal mortality.

D. R. Davis, Child Welfare—Instituting a JOURNAL series as a "Child Welfare Page." Instigated formation of a number of poison control centers. Worked on revision of *Standards of Child Care in Hospitals*. Investigating state institutions for the mentally retarded. Studying juvenile delinquency.

W. H. Crouch, Perinatal Welfare—A new group, members from the last two committees above. A start toward improvement in perinatal morbidity and mortality, now much too high in certain areas.

Laurence Nelson, Medicare—Hours and hours of labor adjudicating questionable Medicare claims.

D. C. Reed, Control of Cancer—Speakers for the spring cancer conference, promising to be best yet.

Ruth Montgomery-Short, Conservation of Hearing and Speech—A specific set of standards for testing and classifying school children.

Only to mention the following active and productive committees: Virgil Brown, Rural Health; Cyril Black, Endowment; L. L. Calkins, Conservation of Eyesight; J. L. Morgan, Tuberculosis Control; E. R. Gelvin, Hospitals; W. M. Mills, History; Tom Butcher, Relations with the Bar Association; Leland Speer, Allied Groups; C. S. Joss, Centennial; P. H. Lorhan, Anesthesiology; J. A. Grove, Safety.

Not bad! Not bad! Says Executive Secretary Ebel, "Never saw more active, vigorous committees."

Not part of our organization, but containing members of ours, the Healing Arts Board and Basic Science Board have displayed statesman-like qualities in meeting many difficult and complicated problems.

Your president is very proud of his Society and its current list of accomplishments.

May you all be blessed with joyous holidays followed by a year of prosperity and gratifying activity.

Fraternally yours.



President

EDITORIAL COMMENT

The End of an Era

On January 1 the American Medical Association will have a new general manager in the personable, altogether capable F. J. L. Blasingame, M.D., of Wharton, Texas. The choice is perfect. The Kansas Medical Society looks forward with pleasure toward his leadership.

But it represents the passing of an era, and for a moment we want to reflect upon the past. George F. Lull, M.D., will continue to serve the A.M.A. now in a most significant responsibility of assisting the president. But look at what he has already accomplished.

We remember 11 years ago the A.M.A. was disturbed and frightened and upset. George Lull has somehow given it stature. This is a vague term you cannot quite photograph, but it is there—you feel it.

You sense this as you recognize maturity in the adolescent. Perhaps that is the most correct description because it has been a period of growth and stabilization. Friends and enemies of the A.M.A. alike can feel this difference. The A.M.A. is grown.

What is this era? You cannot put 11 years on paper, but you can remember some names and you can recall some events. Names like Bert Howard, M.D., assistant manager. He will continue in his office, but he belongs also to the era just completed and has been a large and responsible figure in its success. Then there are (quickly as dozens of names come to mind) Dr. Thomas Alphin and the Washington A.M.A. office, Dr. W. W. Bauer and his staff in the field of education, Dr. Austin Smith as editor of the *Journal*, Joe Stetler of the legal office, Thomas Hendricks of medical service, Leo Brown of public relations, Dr. Crockett with Aubrey Gates of rural health, and more and more.

Under them are others who have performed great service in behalf of American medicine as in the Washington office there is Dr. Kennard and Jim Foristel and in public relations Steve Donohue and Carol Towner and in information Doctors Dukelow and Hein and more and more. One does not dare begin because there is no end.

And in the 11 years of George Lull are great presidents and council chairmen and achievements in hundreds of fields related to medicine—its scientific face and its political and economic sides as well.

These have been great years. These have been the greatest, and today the Kansas Medical Society wants to send its thanks to the organizer, the general, the general manager of those years and to wish him a long and even greater future in the new role he is now accepting in behalf of the A.M.A.

Yes, the last 11 years have been the greatest—up to now, that is. There are in this state those who think the partnership of Blasingame and Lull and Howard and all the others is going to give medicine a team that is even greater than anything ever presented in the past. So perhaps just because of what has gone before, the best is yet to come.

Streamlined State Meeting

Members of the Program Committee for the 1958 annual meeting of the Kansas Medical Society, with the approval of the Council, are making plans to streamline the session in a way which will be of interest to all Kansas physicians. The meeting will be held in Kansas City with members of the Wyandotte County Medical Society as hosts.

The first session of the House of Delegates will be held on Monday morning, May 5, and the second session on Wednesday morning, May 7. Sports events will conclude the meeting on Wednesday rather than begin it on Monday. Specialty groups, including the Kansas Chapter of the American Academy of General Practice, will hold sessions on Monday afternoon. The banquet for the general practice group, featuring Drew Pearson as speaker, will be held on Monday evening.

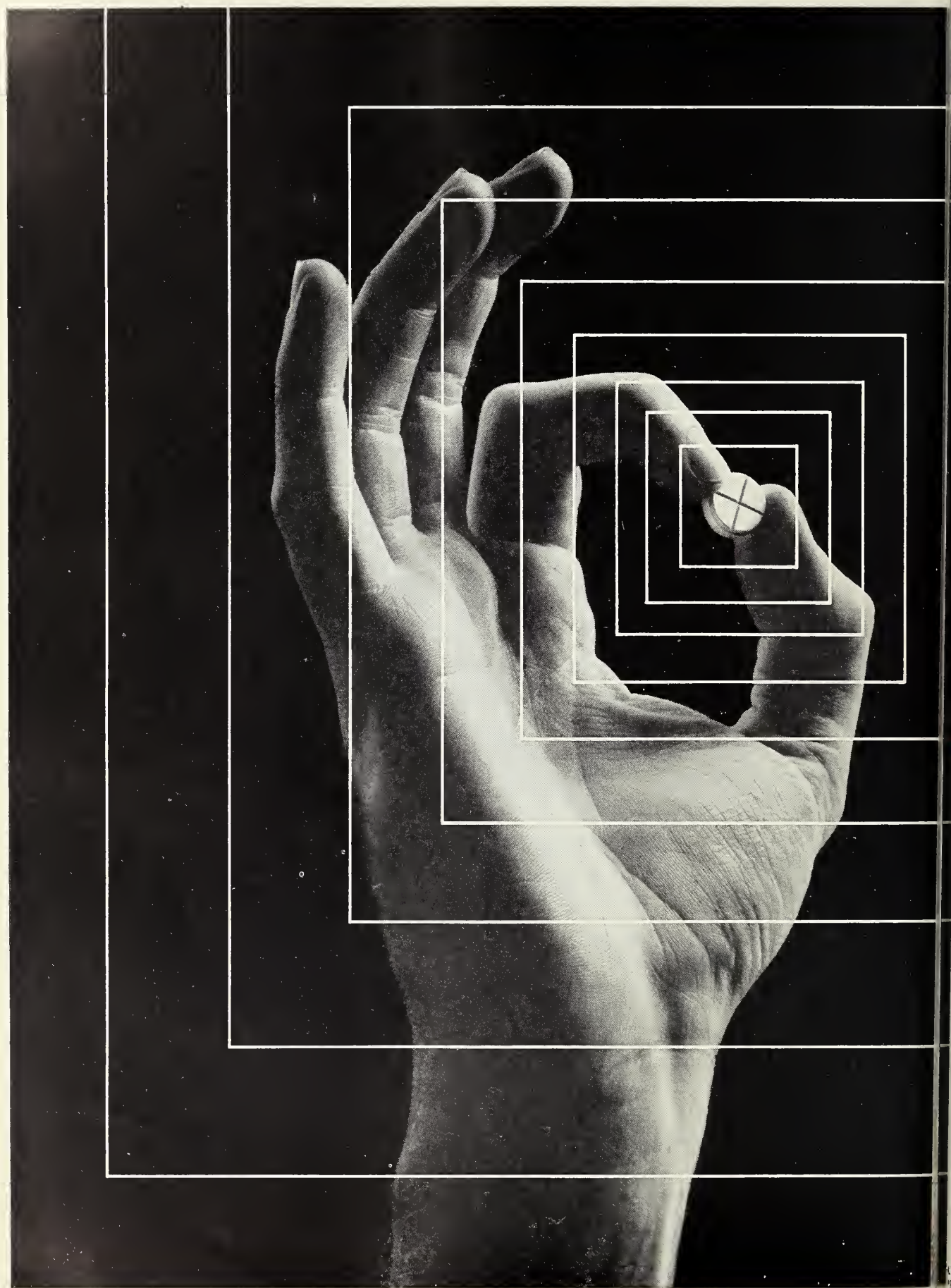
Tuesday will be known as scientific day. The program will include presentations by six nationally known guest speakers covering a variety of subjects. The annual Society banquet will be held on Tuesday evening, and an exceptional program is being planned for that event.

On Wednesday morning, prior to the second meeting of the House of Delegates, there will be a medico-legal symposium, presented by Kansas physicians and attorneys. Members of the Kansas Bar Association will be invited to attend and will also be guests for the sports events and sports banquet on Wednesday evening.

All meetings on Monday and Tuesday will be held at the National Guard Armory, located on 18th Street just off the turnpike. Wednesday meetings, including the second session of the House of Delegates and the medico-legal symposium, will be at the Town House Hotel. The Society's annual banquet will also be at the Town House Hotel.

This departure from the usual format of Kansas Medical Society meetings is being planned to make the session a more attractive, inviting event. The Wyandotte County group is arranging the 1958 session to avoid conflicts and inconveniences that have been the subject of criticism.

Physicians planning to attend are urged to make hotel reservations early.



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1. Nichols, R. L. and Finland, M.: *J. Clin. Med.* 49:410, 1957.



National Society for Medical Research

Editor's Note. The Council of the Kansas Medical Society, in an effort to assist the National Society for Medical Research, suggested that that organization prepare information on its program for the JOURNAL. The following report of the group's activities was prepared by Mrs. Janet Greenwald, editor of the Bulletin for Medical Research.

The National Society for Medical Research, originally founded to deal with a symptom of the disease of public ignorance and misunderstanding of medical and biological science, now functions to attack the disease itself. At first the society was occupied with the stop-gap protection of animal research against immediate threats of legal prohibition and general harassment from members of the antivivisection movement. This effort was quickly successful, and then the society was able to turn to long-range treatment of other symptoms by which the disease manifests itself.

There are many subtle symptoms of this public malady—ignorance and apathy toward the needs and problems of scientific research, resistance to inoculation, militant anti-dissection and anti-experimentalist movements, superstition, and quackery. In attacking the disease, the society administers preventive medicine in two principal ways. First, the society starts

chain reactions through scientific organizations and institutions. For example, through the American College Public Relations Association, the old blockade against full reporting of research was, for the most part, swept away. Use of animals in research ceased to be secret.

A second important part of the society's long range program is the development and propagation of positive action programs to advance research and teaching in biology and medicine. The society formulated a model statute for the utilization of unwanted dogs and cats ordinarily killed in public dog pounds. Today 75 per cent of the medical schools in the United States receive their needed dogs and cats from this source.

The society instigated libel suits totalling \$4,000,000 against the Hearst press that helped end the Hearst campaign against experimental medicine.

The society helped in forming and developing the Animal Care Panel, an organization devoted entirely to the exchange of technical information on the care of laboratory animals.

In September of 1957 a committee of the society began formulating plans for a national conference on the legal environment of medical science. Because of the hodge-podge of laws affecting medical science in the various states, the conference will aim toward producing a uniform legal code for the medical sciences. Included in the model code will be laws governing property rights in dead human bodies, provisions for bequests of whole bodies or parts for bio-anatomical studies and for transplants of organs. Laws governing animal experimentation and disposition of unclaimed animals will also be part of the model code.

One of the most important functions of the conference is that it will be a basis for extensive information and publicity that will explain some of the practical problems and needs of medical science.

The society will continue to augment the chain-reaction public education efforts by producing publications, films, publicity, exhibits, and other educational devices of its own. A limited budget necessitates seeking the leverage of the chain-reaction approach whenever possible, but records must be kept, legal services retained, and watchful eyes kept alert to the environment of medical research. Only by support from those who most directly benefit from its work can the society continue to fight the disease of misunderstanding and ignorance.

Study of Maternal Deaths

The Maternal Welfare Committee has as its main function the investigation of maternal deaths. For several years members of the committee have felt that the results of these investigations were not serving their full usefulness as long as they were confined to the committee. Their educational value to all physicians doing at least some obstetrics should be very great. Therefore, the committee has voted to begin publishing one case with the conclusions of the committee in each issue of the JOURNAL OF THE KANSAS MEDICAL SOCIETY. This series will begin in the January issue, and we hope the articles will be both informative and interesting.

*Robert G. Heasty, M.D., Chairman
Maternal Welfare Committee*

Home accidents are the most frequent cause of death in children up to 15 years of age. They cripple even more children than polio, warns the Kansas State Board of Health.

Tumor Conference

Juvenile Nasopharyngeal Angiofibroma and Laryngotracheal Papillomatosis

EDITED BY HOWARD P. FINK, M.D.*

Case 1

Dr. Stowell (moderator): The following cases illustrate two uncommon, benign but paradoxically dangerous tumors of the upper respiratory tract in childhood. Dr. Proud, will you give us the first patient's history?

Dr. Proud: This patient is a white boy of 13 who for the past 18 months has suffered from intermittent epistaxis, which on occasion has been alarmingly profuse, with the loss of a half-pint to a pint of bright red blood within a few minutes. Some of the attacks have occurred following slight or no trauma; suddenly sitting down or gentle blowing of the nose have been sufficient at times to provoke brisk bleeding. The boy's health has been good otherwise. About a year ago his physician discovered a mass in his nasopharynx; heavy doses of x-ray and radium failed to shrink this tumor, and surgery was resorted to. The operation was attended by severe hemorrhage. The mass promptly recurred and has persisted to the present time.

When the boy was admitted here, we found a purplish-red, smooth, glistening, dome-shaped mass which filled the left side of his nasopharynx, covered the left eustachian orifice, and obscured the left choana. An effusion of xanthochromic fluid was noted behind the left membrana tympani.

Because of the history of previous poor response to irradiation, we considered surgery the treatment of choice. At operation, the tumor was firm and non-compressible, though not rock-hard; it had multiple attachments. It was avulsed from its bed with a ring forceps. Hemorrhage was profuse out of proportion to the size of the mass; the actual excision required somewhat less than six minutes, and during this time the patient lost nearly 1,500 cc. of blood. Bleeding was controlled by a large post-nasal pack.

Dr. Stowell: What was your diagnosis?

Dr. Proud: A rather typical juvenile angiofibroma. These tumors occur apparently exclusively in boys and young men, and some of them regress spon-

taneously during the early or middle twenties; but attempts to define an endocrine factor in their etiology have so far been unsuccessful. They are fortunately uncommon; we have seen 11 in this hospital in the past six years. They have a pronounced tendency to recur following removal. The great danger to a boy with a nasopharyngeal angiofibroma is that of sudden exsanguinating hemorrhage, which may occur following minor trauma.

At operation, clean removal of the tumor by sharp dissection is impossible, and we consider it mandatory to have three pints of blood running into the patient simultaneously, sometimes under pressure, during the manipulation of the tumor. Most deaths from these tumors have resulted from exsanguination, either on the operating table or as a consequence of injury at play. Any operation in the nasopharynx, for example an adenoidectomy, can be catastrophic in the unsuspected presence of one of these tumors. The nasopharynx should always be carefully inspected and palpated before an adenotome is applied. Fortunately, the firm, dark, smooth angiofibroma can be easily distinguished from the soft, compressible, pale, rugous adenoid tissue.

The tendencies of the angiofibroma to bleed freely and to recur after removal are associated with its apparent ability to form multiple attachments. As it grows, the tumor seems to pick up and parasitize vessels at a distance from its site of origin, so that it is frequently impossible to determine the main or original point of attachment. This leapfrog type of growth can eventually result in invasion of areas less accessible than the nasopharynx, such as the orbits or cranial sinuses. Deaths have occurred from penetration of the tumor into the anterior cranial fossa. Therefore, in spite of the difficulty and danger of surgical excision, operative removal may have to be done repeatedly, unless the tumor is attacked while it is still small enough to be completely eradicated.

Dr. Helwig: Such invasive clinical behavior points toward malignancy; and yet these angiofibromas are quite uniformly benign as far as histologic characteristics are concerned. Bone destruction by the tumor, when it occurs, is the result of pressure necrosis, not true invasion. The tumor in the present case is typical

* Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Fink is a Trainee of the National Cancer Institute.

microscopically as well as grossly; it consists of a rich network of thin- or thick-walled vascular spaces, separated by cellular fibrous tissue containing plump stellate or spindled fibroblasts (Figure 1). No inflammatory reaction is present. There is remarkably little histologic evidence of the previous irradiation.

Dr. Tice: This tissue must be a regrowth of the tumor which has occurred since the first irradiation and resection a year ago. These angiofibromas are radiosensitive to some extent, although repeated courses of radiotherapy may be necessary, just as excision may have to be done more than once when the tumor is treated surgically. In my experience, the best plan of therapy is usually a combined one: radium, followed in about six weeks by surgical resection. The radium, in a heavily filtered capsule, is anchored in the nasopharynx, in close contact with the tumor, with strings and packs, and a total dose of 3,000 to 4,000 roentgens is given. Some of these tumors, indeed, can be controlled in this way by radium alone, without resorting to surgery.

Dr. Helwig: It is worth noting that the extreme vascularity of this tumor sets it apart from fibromas of other regions. Some pathologists believe that the large irregular vessels, many of which are poorly supplied with muscle or lack a contractile coat al-



Figure 1: Photomicrograph of tumor from Case 1, showing numerous vascular spaces in cellular fibrous tissue. Magnification 90X.

together, are themselves neoplastic;¹ hence the preferred term is angiofibroma.

Dr. Stowell: These abundant atypical vessels must therefore have less than normal power to close once they have been severed. This lack of contractility is apparently the principal factor in causing the almost unbelievably profuse bleeding that can occur from these tumors.

Case 2

The second case concerns another troublesome recurring tumor, this time an epithelial one. Will you tell us about this patient, Dr. Bridwell?

Dr. Bridwell: This white boy is now three years old; he was first seen here at the age of one year, with a history of a hoarse cry for four months. Direct laryngoscopy disclosed a papillary growth in his larynx which was excised through the laryngoscope. One month later he returned because of respiratory difficulty which necessitated a tracheostomy. Since that time, he has had to have about two dozen endoscopies for removal of these papillomas.

About six months ago he was brought here as an emergency patient because he was in acute respiratory distress even with his tracheostomy tube in place. We put a bronchoscope down through the tracheostomy opening and found that he had multiple papillomas growing in his trachea as far down as the carina, and a small mass of papilloma was partially occluding each main bronchus. The bronchial tumors were resected, but since this time the boy has required endoscopic removal of papillomas from his trachea, as well as from his larynx, at intervals of a month or six weeks. He has remained in remarkably good general health except for the periodic narrowing of his airway by the recurring tumor, which his parents have learned to recognize by the way he breathes.

These laryngeal papillomas occur predominately in children and have a characteristic appearance; through the endoscope they are seen as pedunculated or flattened elevations of the mucosa which have a frond-like, filamentous surface. The site of predilection is the true vocal cords, and the false cords are next most commonly involved. Sometimes the tumors remain single, and excision, perhaps repeated several times for local recurrences, is curative. Often, however, the tumor spreads downward over the mucosal surface. In the case under discussion, for instance, the mucosa of the larynx and trachea now resembles a heavy growth of grass on a lawn, or the thick nap of a Persian rug, because of the hundreds of tiny papillomas growing there.

Dr. Helwig: These tumors, like the nasopharyngeal angiofibromas discussed previously, appear perfectly innocent microscopically, in spite of their

marked tendency to recur and to spread by implantation. They consist of slender branching stalks of vascularized connective tissue, covered by thick stratified uncornified squamous epithelium. They bear a close resemblance to condylomata acuminata. The epithelial cells are quite uniform and regular.

Dr. Bridwell: Although the growths are always resected with the patient in the head-down position, they bleed rather freely—though by no means as profusely as the angiofibromas—and the tumor tissue may easily be seeded down the trachea in the process of excision. Unfortunately, in some cases the implantation may eventually extend peripherally past the major bronchi into areas where the tumor cannot be reached by the bronchoscope.

Dr. Stowell: Such cases may have a fatal outcome because of irremedial obstruction of the airway. I have seen one case at autopsy in which even the finer bronchi were packed full of hundreds of tiny papillomas.

Dr. Bridwell: However, two big factors operate in the clinician's favor when he deals with these tumors. The first of these is the fact that nearly all juvenile laryngeal papillomas regress at about the time the patient reaches puberty.² This tendency to involute is much greater than that of the nasopharyngeal angiofibroma, so that persistence of a papilloma past the age of 20 is a rarity. Some of them, indeed, disappear spontaneously before puberty. The second factor is the increase in the diameter of the patient's airway as he gets older, which allows him to tolerate the papillomas with less danger of obstruction.

The pubertal involution of these tumors suggests, as with the angiofibromas, some sort of hormonal influence; but hormone treatment has in the past been without proved effect. At present, the best therapy is conservative surgery; one should keep the larynx and trachea open by trimming off the tumors as they appear, and wait for regression. It is important that only the tumor be removed; excision should not be wide and the base should not be cauterized, since cicatricial stenosis may follow such procedures. However, touching the base of the papilloma with podophyllin after excision does not cause scarring and seems to reduce the recurrence rate.

Dr. Helwig: I might add that the occasional papilloma that persists into adult life may be mistaken, by both surgeon and pathologist, for papillary carcinoma, and unnecessarily radical surgery may be performed.

Dr. Bridwell: There is a growing body of evidence that a virus may be the ultimate cause of these papillary lesions. We have repeatedly tried, always unsuccessfully, to culture a filtrable agent from these lesions after they have been surgically removed. We

have even given the patient under discussion serum from a child who had recovered from papillomatosis of the larynx, in the hope of transferring some antibodies, but again without success. If a virus etiology can be proved, new therapeutic possibilities may follow.

Dr. Stowell: The tendency of these lesions to recur and propagate superficially, in spite of their histologically benign appearance, certainly suggests an infectious cause, presumably a virus. Two somewhat similar papillomatous lesions, also frequently seen in children, the common wart and molluscum contagiosum, are similarly autoinoculable and have been proved to be due to a virus.

These cases illustrate two recurring tumors of the upper respiratory passages in children and young adults, which, though benign, are dangerous and occasionally fatal, the one because of hemorrhage and the other because of airway obstruction.

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1. Sternberg, S. S.: Pathology of juvenile nasopharyngeal angiofibroma, *Cancer* 7:15, 1954.
2. Kohlmoos, H. W.: Papilloma of the larynx in children, *A.M.A. Arch. Otolaryngol.* 62:242, 1955.

Programs on Urology

A schedule of programs to be presented by the Kansas City Branch of the American Urological Association has been announced for the first four months of 1958 by Dr. C. Laurence Johnson, secretary of the organization. All sessions will begin with a dinner at 6:00 p.m. at the Pine Room in the Union Station, Kansas City, and all interested physicians are invited to attend.

Urological residents of Kansas City General Hospital will present a program on "Renal Ectopia" on January 22; Dr. Pratt Irby, Fort Scott, will speak on "Crystalluria" on February 26; Dr. Robert Lemire, Sedalia, Missouri, will discuss "Pathology of Kidney Pelves and Ureters" on March 26, and Dr. Robert B. Bristow and Dr. John N. Martin of St. Joseph, Missouri, will give papers on "Traumatic Injuries of the Kidney" on April 23.

The first meeting of the series was held last month with a team from the University of Kansas Medical Center composed of Dr. William L. Valk, Dr. John Foret, and Dr. Clyde Kurtz speaking on "Ureteral Tumors."

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Just how much money does the federal government spend on health programs and just how is it spent?

The answers are not easy to come by, but each year the Washington Office of the American Medical Association gathers together all of the bits and pieces of information needed to explain where and how the U. S. is involved in medicine, from cancer research to treating workmen's sniffles. Some of the material comes directly from appropriation bills, but where programs and projects are not identified there, the responsible government officials are consulted for the breakdown.

For all health and medical purposes, the U. S. during the current fiscal year is spending approximately two and one-half billion dollars. This—despite months of economy talk in the administration and in Congress earlier in the year—is about the same figure as last year.

The survey also unearthed some interesting side-lights that show perhaps more graphically than the dollar marks the extent to which federal medical activities are spreading among almost all agencies and departments.

At least 23 U. S. cabinet departments and independent agencies are engaged in some medical operations, and there are at least 79 separate health-medical activities worthy of listing and describing. Many of these in turn are responsible for scores and scores of individual operations.

This year the relatively new Department of Health, Education, and Welfare tops the list of all departments in health-medical spending with \$849,394,800, bounding past Veterans Administration and Defense Department, which up to now have been at the head of the column. VA is spending \$849,374,000, within \$20,000 of H.E.W., but Defense Department this year drops back more than \$80 million, to \$702,000,000, largely because the decreasing size of the armed forces means fewer uniformed men and dependents to care for.

Next comes Atomic Energy Commission, but its medical spending of \$40 million—mostly for research—is far down the column from the Big Three.

International Cooperation Administration has \$37 million to help our friends overseas to raise their medical standards. The other 19 departments and

agencies have substantially less, the last item being the \$12,145 allocated to the physician entrusted with keeping members of Congress as healthy as possible.

For the first time the A.M.A. report compiles information on the programs in which the U. S. participates for payments because of disability. Among those receiving these payments are veterans, disabled beneficiaries under social security, disabled railroad workers, etc.

Because this money is not all federal and comes from several tax sources—O.A.S.I. and railroad payroll deductions as well as general U. S. revenue—it is not added to other federal medical costs in the A.M.A. study. For the current fiscal year the total of these "payments for disability" is about \$3.2 billion.

Notes

Federal Trade Commission and Food and Drug Administration joined together to warn drug manufacturers against using "false and misleading claims" to promote drug products for use against Asian influenza. It was pointed out that vaccine is the only protection, and that a physician is needed if there are complications.

Meeting at the invitation of the Children's Bureau, a group of specialists in the health fields discussed use of x-rays of the newborn and pregnant women and concluded that restraint must be exercised.

There has been remarkable progress in the last five years in the fight against tuberculosis, but there are still at least 250,000 active cases in the United States. This is the gist of a special nationwide survey by Public Health Service and the National Tuberculosis Association.

While visiting Russian women scientists were telling of a 25-cent drug to treat Asian influenza, it was learned that some members of the Russian Embassy staff in Washington had been vaccinated with American vaccine.

In a major address, President Eisenhower pleaded for more private financial aid to medical colleges and warned against the dangers of federal controls in this field.

When asked his opinion on legislation for the hospitalization of the aged under social security, Secretary Folsom warned against the tax increase that

would have to accompany the plan, possibly a suggestion that the administration will oppose the idea next year as it did last.

Reversing a previous policy, the Internal Revenue Service now says it is possible for a group of doctors to practice as an "association," thereby qualifying for approximately the same tax benefits they would receive under the proposed Jenkins-Keogh law.

Rules for Safe Hunting

The "Ten Commandments" for safe hunting, as issued recently by the Kansas State Board of Health, are:

1. Treat every gun with the respect due a loaded gun.
2. Guns carried into camp or home, or when otherwise not in use, must always be unloaded.
3. Always be sure barrel and action are clear of obstructions.
4. Always carry the gun so that the direction of the muzzle is controlled at all times. Keep the gun on safety until you are ready to fire.
5. Always make sure of the target before pulling the trigger.
6. Never point a gun at anything that is not to be shot.
7. Guns and ammunition should be stored separately and beyond reach of children and careless adults.
8. Never climb a tree or fence or jump a ditch with a loaded gun.
9. Never shoot a bullet at a flat, hard surface or the surface of water.
10. Avoid alcoholic drinks before and during shooting.

A study of fatal hunting accidents last year reveals that 95 per cent involved violation of one or more of the above rules. During the last five-year period, 170 Kansans lost their lives in firearms accidents.

Polio Funds for Research

The National Foundation for Infantile Paralysis has announced an addition of one million dollars to its research fund for 1958, bringing the total to \$4,700,000. Most of the amount will be devoted to basic research. Among projects to be continued and expanded are studies of how viruses affix themselves to and invade cells, studies on the composition and structure of viruses, studies of the structure and function of nucleic acid, and studies of the properties of cells.

DEATH NOTICES

VESTER R. VINSANT, M.D.

Dr. V. R. Vinsant, 58, retired physician in Summerfield, died in a Nebraska hospital on October 29 after a short illness. Widely known as an aviation enthusiast, Dr. Vinsant had his own private airport and used a plane in making calls. He was a graduate of the University of Nebraska College of Medicine, class of 1923, and began practice in Summerfield in 1924.

JAMES EMERSON FARMER, M.D.

An 81-year-old retired physician in Wichita, Dr. J. E. Farmer, died at a hospital in Wichita on October 31. He had practiced in Wichita since his graduation from Meharry Medical College, Nashville, in 1902 and was an honorary member of the Sedgwick County Medical Society.

FRED AKIN GARVIN, M.D.

Dr. F. A. Garvin, who was graduated from the Kentucky School of Medicine in Louisville in 1893 and who had practiced in Augusta since 1902, died in Augusta on November 1. In addition to professional duties, Dr. Garvin was interested in civic affairs and had served his city as mayor for 12 years. He had been honored by the Augusta Chamber of Commerce on the occasion of his 50th year of practice. He was an honorary member of the Butler County Medical Society.

EUGENE ALBERT REEVES, M.D.

Dr. E. A. Reeves, 50, Kansas City physician, died on November 7 after a short illness which began during a hunting trip to the Ozarks. After graduation from Baylor University College of Medicine in 1934, he completed a residency in surgery and obstetrics in Lubbock, Texas, before beginning practice in Kansas City in association with his father, the late Dr. E. A. Reeves, Sr. During World War II he served for 52 months with the Army Medical Corps. Dr. Reeves had been active in Boy Scout work and at the time of his death was serving as a member of the executive board of Kaw Council.

Divine Healing

The History of Faith Cures and Their Status Today

ROY R. HIEGER, M.D., *Kansas City*

"Is there any man sick among you? Let him bring in the priests of the church and let them pray over him, anointing him with oil in the name of the Lord."

"And the prayer of faith shall save the sick man; and the Lord shall raise him up; and if he be in sins they shall be forgiven him." St. James, Chapter 5, Verses 14-15.⁴

The absolute efficacy and relative merit of a new therapeutic agent are determined by comparison and clinical trial. This paper is an appraisal of the universal curative advocated by St. James. It is an evaluation of faith healing, based upon its centuries of clinical trial, and an estimate of its relative merit as compared with other products and methods of treatment.

Though we no longer regard as valid, primitive man's initial assumption that disease is punishment inflicted by a supernatural being or God, a few physicians and many laymen still accept its obvious corollary, i.e., if disease is inflicted by a god, it can be relieved by appealing to or appeasing that god. Evidence to this effect is provided by Dr. Hess,¹⁹ a past president of the American Medical Association, who said: "A physician who walks into a sick room is not alone. He can only minister to the ailing person with the material tools of scientific medicine—his faith in a higher power does the rest."

Public opinion, as evidenced by newspapers, radio, and television, lends quantity if not quality to the support of this concept.

Textbooks of medicine exist in apparent contradiction of Dr. Hess. Conspicuous by their absence are references pertaining to the therapeutic value of prayer, the priest as a consultant, the application of holy oils, or resort to a higher power. Are we then to assume their value is not sufficient to merit inclusion? Only by determining the validity, efficacy, and relative merit of divine healing can this question be answered.

"Angry Gods, Wicked Witches, and Dirty Devils"²⁰

A brief excursion into the history of medicine and

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Hieger is now serving his internship at the University of Kansas Medical Center, Kansas City.

religion is almost an impossibility. However, some knowledge of their historical relationship is necessary if we are to understand their present status. The origin of the phenomenon to be examined will be similarly apparent.

Disease as evidenced by the telltale lesions observed in prehistoric fossils has probably existed as long as living matter. Java man who lived 350,000 years ago is said to have had a diseased femur. He is quite likely the earliest evidence of disease in humans. We now know the earliest savages regarded disease as supernatural in origin, the work of an unfriendly demon, or the punishment inflicted by an angry god. Therefore they attempted to rid the body of its assumed affliction. They made sacrifices to propitiate the offended deity, did penance for their implied sins, or sought the intervention of more friendly spiritual forces. Beating, starving, or otherwise torturing the victim was a popular treatment employed to make the body as unpleasant an abode as possible. On occasion the spirit was enticed by the offering of a more pleasant lodging. The demon of jaundice might thus be lured into the body of a yellow canary.¹

Belief in the supernatural origin of disease is expressed in the earliest available records, those of Egypt and Mesopotamia. In Egypt all sickness was attributed to the gods, health depending to a great extent upon obedience to these gods and their propitiation with offerings. From inscriptions on tombs and temples as well as certain papyri, archeologists have deciphered various incantations and invocations to the gods, i.e., specific words to be recited when healing a patient. Incubation or temple sleep was popularized at this time. Numerous temples erected in honor of Imhotep, the Egyptian god of medicine, were utilized for this purpose.

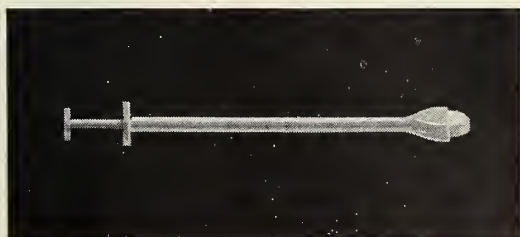
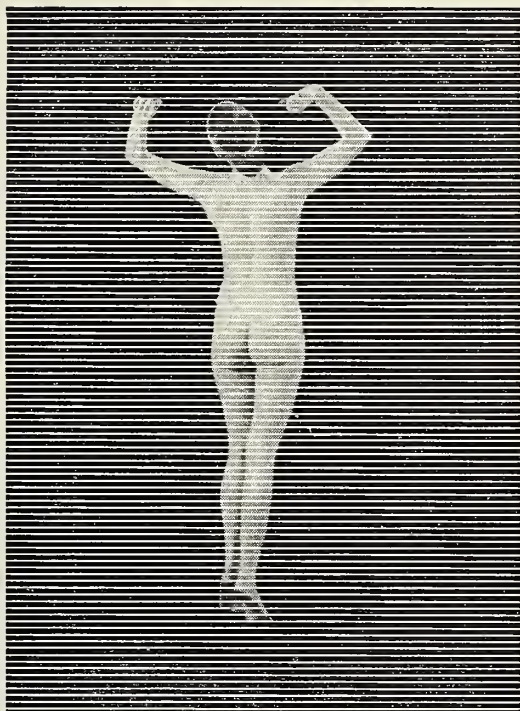
The Hebrew concept of disease was probably the direct product of Egyptian thought or was at least greatly influenced by it. Among the Hebrews medicine as a science did not exist. Disease was again looked upon as a punishment for sin which incurred the wrath of God. Healing was the province of priests. Possession was frequently the diagnosis and exorcism the treatment.

The Greeks, like their Egyptian predecessors, utilized the system of temple healing. In the eighth and seventh centuries before Christ 300 temples

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were erected to Asklepios. Here, after bathing, the sick were admitted to spend one to two days in prayer and meditation. Disease supposedly left the body while the patient slept.

Hippocrates (460-350 B.C.) assumed the task of divorcing in part, at least, the practices of medicine and theology. Hippocrates conceived a rational system of medicine in which disease was considered a natural phenomenon. He had this to say of epilepsy, a disease frequently referred to as sacred: "It is not in my opinion any more divine or sacred than any other disease but has like them a natural cause and its supposed divine origin is due to man's inexperience."²¹

Though he did not believe in divine intervention he apparently realized the importance of suggestion since healing and magic in the temples continued throughout his era and later.

After the death of Hippocrates, theologic argument again asserted its sterilizing influence. The arrival of Rome on the world scene and its subsequent rise to dominance did not carry with it any improvement in the status of medicine. In spite of such men as Seneca (3 B.C.-65 A.D.), Celsus (first century A.D.), and Galen (130-201 A.D.), the level of medical practice in Rome was distinctly low.⁵¹

In the New Testament where much of Christ's healing revolves about the idea of demons and disease, the acceptance of the supernatural origin is evident. Christianity focused on the spiritual rather than the physical aspects of life. Hippocrates was forgotten and Galen ignored.¹ The effect of the adoption of the Christian religion is apparent in the words of Basil (360 A.D.), Bishop of Caesarea, who insisted that disease was a manifestation of divine purpose and action, effected by means of demons. He indicated that the church would look with disfavor upon treatment by any means other than prayer.

St. Augustine in the fifth century said: "All diseases of Christians are to be ascribed to demons, chiefly do they torment the flesh baptized, yea, even the guiltless newborn infant."⁵¹ The treatment was of course prayers to God, exposure to relics, and the laying on of hands. Medicine had reverted to a form of healing like that of a thousand years before Christ.

In 700 A.D. Theodosius decreed that pagan rites were to be prohibited and pagan temples destroyed. The scientific attitude and cultural inheritance from Greece had by that time all but vanished. Science was moribund.⁵¹ The works of Hippocrates and Galen were collected in monasteries and essentially buried there. Revelation replaced reason, rational medicine was for a time replaced by superstition as is evidenced by much of the New Testament writings.¹ For 1,000 years there was no real progress in

medicine or science. The dominance of the church with its hostility towards science and its intolerance of anything unorthodox was a heavy hand on the throat of medical progress. The clergy zealously retained the gathered learning as a sceptre to sway the masses who naturally were left in ignorance.⁵¹

The flame of science was not completely extinguished and was finally rekindled by the Arabs who swept up from Africa into Southern Europe, bringing with them much of the ancient learning which they had nourished. Through the crusades medicine and other sciences were regained. In the 13th century great universities arose, still closely associated with monasteries.¹ The era of angry gods, wicked witches, and dirty devils had reached its peak and gradually began the long decline. From 1500 onward medicine convalesced but for a long period did not approach the Hippocratic standard. With increasing intelligence, devils became less important and shrines and relics took their place. At the time of the crusades "when this form of metaphysical medicine was in flower, there was in Europe enough wood and nails from the true cross to have built a chapel. There was more than a barrel of the blood of Jesus and Mary. There was more than a bushel of toenails of St. Peter. . . . There were no less than eight different thigh bones of the Virgin Mary in eight different cathedrals in Europe."²⁰

Healing by suggestion and divine intervention continued to find acceptance and subsequently received the support of popes, theologians, and such eminent men as John Knox, John Wesley, Martin Luther, and John Calvin. It was supplemented by mesmerism, hypnotism, Christian Science, and many other healing cults. The natural but more scientific outgrowth of these was later to be supplied by Freud, Jung, Adler, and our modern psychologists and psychiatrists.⁵¹

Conscious of this long history of the association of medicine and religion, let us turn to the 20th century, a century where we have reached almost unbelievable scientific and mechanical achievements, and attempt in the light of our present knowledge a critical evaluation of "divine healing" as we know it today.

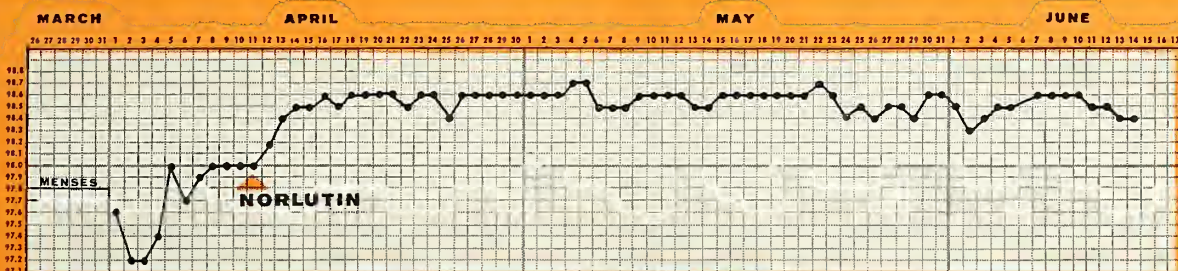
An Appraisal of the Available Literature

Apparent from the beginning is the obvious lack of medically inspired research in this field. It may be that any investigation of paranormal phenomena is thought to savor of unorthodoxy and should therefore be avoided. While this is a likely explanation, it can hardly be condoned. The scientific method and attitude with its resultant statistics based on accurate diagnosis and unbiased observation of results are to be had only from medical sources. The

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♦ Greenblatt, R. B.: *J. Clin. Endocrinol.* 16:869, 1956.

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bulk of the literature is nonmedical; the miraculous cures claimed are based for the most part on conjecture. None of the faith healers kept adequate records; they depended largely upon the patient's testimony for diagnosis as well as for evidence of cure. They offer no accurate statistics, they are unable to diagnose, and their ignorance of the natural course of disease precludes any possibility of reliable information.

If we allow that about 90 per cent of all acute sickness will ultimately resolve even if left untreated, it should be apparent that this is indeed a fertile field for ignorance, deception, and quackery. The obligation this places on physicians should likewise be apparent. The following illustration will obviate the need for further comment. Rose⁴² has reported the case of an elderly man who, after being blind in the right eye for 50 years, sought the aid of a local faith healer. He subsequently noted his vision was improving. His "long sight" returned first. This miraculous cure was later described by the press. Afterwards, when he was examined by an ophthalmologist, the cause of the visual improvement was obvious. The cataractous lens had spontaneously dislocated back into the vitreous chamber, a condition referred to as "couching." The final diagnosis received no publicity. And so on ad infinitum, ad absurdum, ad nauseum.

Many of the cases reported in the literature, medical or lay, are not nearly so complete as the admittedly scanty one above, and hence are unacceptable as scientific, statistical, or medical evidence. It is not possible to draw valid conclusions from them. Their only value lies in pointing up the need for more extensive investigation.

Miraculous Cures of Organic Disorders

A case deserving of consideration should have full details of diagnosis with corroborative evidence such as x-ray, laboratory, histological, etc., and any findings suggestive of a psychosomatic etiology. Case reports of this type are rarely found in association with claims of miraculous cures. There are, however, several sources in which this association can be found. The largest such source is the record of the Bureau des Constatations at Lourdes, France. This group was commissioned to investigate cases of so-called miracles, to exclude psychogenic and hysterical conditions and to determine whether or not a reported case was indeed a miracle. Other groups and organizations have received similar commissions and requests. Notable among these is the Archbishops' Commission on Divine Healing, a commission set up by the archbishops of Canterbury and York. This group eventually sought the aid of the British Medical Association. The report of the latter is the most

recent (1956) and probably the most valuable elucidation of divine healing that has appeared to date. Interested individuals such as Rose,⁴² Hinckle,²⁰ and McComb³⁴ have taken it upon themselves to explore this field. Major³³ in his *Faiths That Healed* presents an unbiased appraisal of many of the well-known faith healers, shrines, and saints to whom miraculous cures have been attributed.

First, let us consider the "miracles" of Lourdes, a shrine familiar to all Catholics and many Protestants, a shrine sought out by several million people yearly, the site of many "miraculous" cures. The accounts read in the daily newspapers are worthless. A reliable source, the official record of the Bureau des Constatations is available and provides a more objective evaluation. Before being accepted by the bureau as a cure, the patient must have been examined by a physician and diagnosed prior to arrival at Lourdes and reexamined by other medical doctors after the supposed cure. The case must then undergo the scrutiny of a second group of 25 doctors and priests nominated by the archbishop. They study the documents and give their report to the archbishop of Paris who decides, on the basis of conditions prescribed by Pope Benedict XIV, whether the cure was a supernatural divine miracle or a supernatural diabolic miracle.⁴⁹

Koepchen²⁶ reports that between 1858 and 1861 only 16 miraculous cures were recognized in the official records. Thereafter, no record was kept until 1928. However, 3,353 cases were reported in the local press between 1858 and 1904. In 1928, 16 cures were reported; in 1929, 14; in 1937, 8. Siegmund⁴⁹ reports that in 1948, 3,000,000 persons visited Lourdes. Three hundred thousand of these were ill, 83 were considered cured at the time of their visit, but only 15 were still cured one year afterwards. Of these 15, only 3 cures were considered miracles and recorded as such by the local bureau. One does not need statistical corroboration to see that three out of 300,000 is not significant.

Siegmund also presents a long case history of a tuberculous patient reported miraculously cured at Lourdes and recorded there as such by the archbishop of Paris. Never at any time was guinea pig inoculation or a histological examination reported to verify the diagnosis.

Schleyer,⁴⁴ whose report is available in a monograph, collected all the available references and reports of cures at Lourdes, evaluated a considerable number of cases histories, and from all this material covering many years gleaned only 232 cures which could be discussed on a scientific basis. He submitted these cases to many specialists in other countries who accepted only 37 as unexplainable, and most of these with great reservations. His conclusion was that the

Evidence continues to accumulate verifying the effectiveness of Gelatine in the treatment of brittle fingernails. Investigators report that the nails show objective evidence of improvement.^{1,2,3,4} Furthermore, patients often volunteer that their nails "feel stronger," "look smoother," and "I can pick up things without them hurting."¹ Evidently the subjective sensations associated with improvement are nearly as important to some patients as the positive physical change in the nails' appearance.

Improvement Noted in 81% of Patients

See the chart below for a summary of the effect of Knox Gelatine in brittle fingernails as observed in all published reports. Photographic evidence of improvement, much of it in color taken before and during treatment, is available for most of the patients.^{1,2,3} Please note, however, that where Gelatine was used in the treatment of pathological conditions associated with brittle fingernails only in psoriasis did the data show definite improvement.^{1,3,4}

Response to Gelatine in Brittle Fingernails

| References | Dosage | Duration of treatment | No. patients w/ brittle nails | No. patients improved | No. patients w/ brittle nails and other pathology | No. patients improved |
|--|-----------------|-----------------------|-------------------------------|-----------------------|---|-----------------------|
| 1. Rosenberg, S., Oster, K. A., Kallos, A. and Burroughs, W.: <i>A.M.A. Arch. Dermat.</i> 76:330, (September) 1957 | 7 Gm./day | 3 months | 50 | 43 (86%) | 32 ^a | 9 |
| 2. Schwimmer, M. and Mulinos, M. G. <i>Antibiot. Med. & Clin. Therapy</i> 4:403, (July) 1957 | 7.5 Gm./day | 11-16 weeks | 18 | 15 (83%) | | |
| 3. Rosenberg, S. and Oster, K. A.: <i>Conn. State Med. J</i> 19:171, (March) 1955 | 7 to 21 Gm./day | 15 weeks | 36 | 26 ^b (72%) | | |
| 4. Tyson, T. L.: <i>J. Invest. Dermat.</i> 14:323, (May) 1950 | 7 Gm./day | 13 weeks | 12 | 10 ^c (83%) | | |
| Totals | 7-21 Gm. | 11-16 weeks | 116 | 94 (81%) | 32 | 9 (28%) |

- a. Gelatine improved psoriatic nails in 5 out of 12 cases. In onychomycosis and other pathological conditions of the nail it was of no appreciable help.
- b. Of the failures, 2 had congenital disease of the nails, 3 were diabetics and 3 took the medication for less than one month.
- c. One patient with psoriasis and arthritis and one patient with psoriasiform nail changes showed improvement in 2 and 3 months respectively.

BRITTLE FINGERNAILS

Important Note

The pharmacodynamic effects of Gelatine are manifested through its high Specific Dynamic Action, and therefore, depend upon adequate and prolonged intake. All published clinical research has been conducted using 7 to 21 grams (1-3 envelopes) of Knox Gelatine per day for the three to four months that are required for complete regrowth of the nails. Smaller dosage would induce a lesser specific dynamic action and thus prove ineffectual in correcting the brittle nail defects. More detailed information on brittle fingernails and reprints of the two more recent clinical reports are available on request. Please use the attached coupon.

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Please send reprints of the following articles:

☐ Rosenberg, S., Oster, K. A., Kallos, A. and Burroughs, W.: *A.M.A. Arch. Dermat.* 76:330, (Sept.) 1957.

☐ Schwimmer, M. and Mulinos, M.G.: *Antibiot. Med. & Clin. Therapy* 4:403, (July) 1957.

YOUR NAME AND ADDRESS

Lourdes commission was too liberal in its designation of miracles and that the 37 accepted cases were not a significant number. He did not consider the possibility of spontaneous regression as an explanation for the 37 cures.

McComb³⁴ estimates that 3 per cent of all persons visiting the shrine of Lourdes are benefited but states the cures are not beyond the powers of faith, suggestion, and self suggestion.

Hinkle²⁰ estimates that of the 10,000,000 pilgrims over the last 50 years, approximately 4,000 have been cured or one in every 25,000. Although this figure is somewhat higher than those previously quoted, it too is obviously statistically insignificant.

In its report on "divine healing" the British Medical Association states: "In spite of the immense pressure of popular enthusiasm, the number of miracles actually attested and registered over the years has been exceedingly small (not over one every year)."¹⁰

Emile Zola,⁵⁵ one of the many men who has been interested in the "miracles" of Lourdes said in his *Lourdes*: "I will admit I came across some instances of real cures. Many cases of nervous disorders have undoubtedly been cured and there have also been other cures which may perhaps be attributed to errors in diagnosis on the part of doctors who attended the patients so cured. . . . Remember that most of the sick persons who go to Lourdes come from the country, and the country doctors are not usually men of great skill or experience."

Today very few miracles are recognized, quite out of proportion to the millions seeking cure. The patient is now examined on arrival at Lourdes, and extensive reports are required from the patient's local physician. The previous records, however, cannot in retrospect be corrected.

Lourdes is the largest but certainly not the only shrine of its kind. Of more recent times (1917) is the shrine of Fatima in Portugal. Shrines of various saints have existed at one time or another, for example, St. Lucy Odile, St. Clair, and St. Augustine, all of whom were revered at one time as patron saints of the eyes. Miraculous cures were attributed to their intervention.²⁷

The most recent investigation of supernatural or "divine healing" was undertaken in 1954 by the Committee on Divine Healing of the British Medical Association and reported in 1956 in booklet form.¹⁰ This committee was appointed at the request of the Commission on Divine Healing set up by the bishops of Canterbury and York.² They asked the British Medical Association for its evaluation of spontaneous cures of apparently incurable disorders or of rapid or accelerated recovery from serious illness following spiritual ministrations. The commission asked whether there was any evidence of the physical or psycho-

logical value of healing services, i.e., the laying on of the hands, unction, pilgrimages, or the influence of public and private prayer.²

Pertinent questionnaires were distributed among British physicians including members of the Christian Medical Fellowship. Inquiries were restricted solely to members of the medical profession. In cases of alleged spontaneous healing, full details were requested. The committee's task was thereafter one of evaluation of the replies to the questionnaire, of the available literature, and the claims and methods of various healing cults. The types of illness said to be cured by spiritual healing include both organic lesions and psychogenic or psychosomatic disorders.

Most, if not all, of the "cures" of organic diseases (those not of an alleged psychogenic nature such as peptic ulcer or ulcerative colitis) claimed for spiritual healing could be explained in the view of the committee by mistaken diagnosis, mistaken prognosis, alleviation, remission, the effect of combined treatment, or spontaneous cure.¹⁰

The misunderstandings that arise in cases of wrong diagnosis are legion. For example, hysterical paralysis might without sufficient investigation be diagnosed as a cerebrovascular accident with secondary hemiplegia. An impressive religious service or psychiatric therapy may benefit such a patient, and there would be no need to doubt the efficacy of the former or of the latter.

Wrong prognosis is even more frequently the explanation of an apparent cure than wrong diagnosis. The probable course of a disease as suggested by one's past experience is sometimes not the course which the disease takes. We are all familiar with the patient who is given only a few months to live, but who lives for years. In such cases if there have been spiritual ministrations by clergy or other healers, the cure may quite likely be ascribed to them.

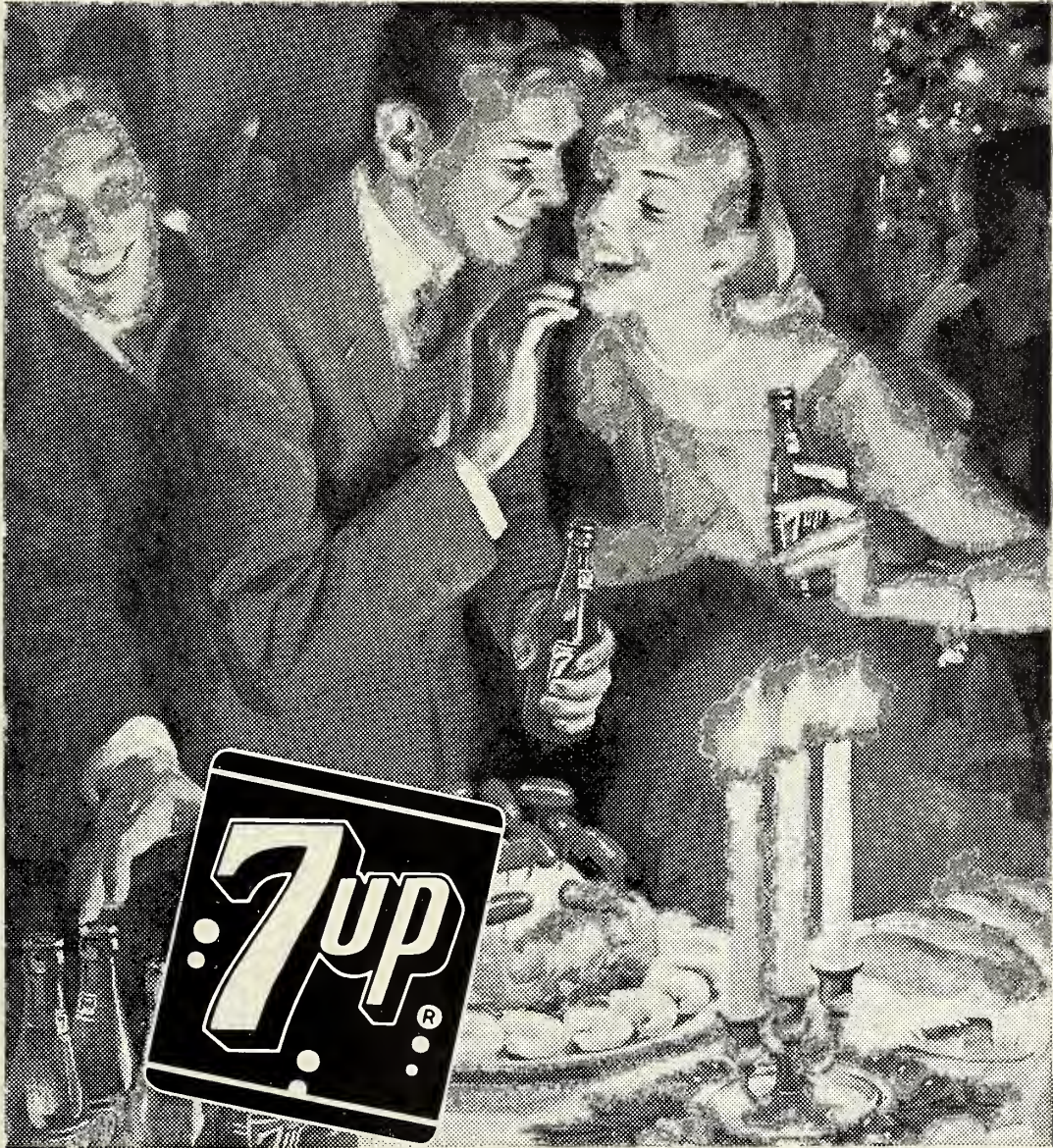
Alleviation of one or more symptoms, such as pain, may be mistaken for a cure by the patient. Admittedly the removal of pain may facilitate recovery, but the underlying disease is not so rapidly overcome as was the pain.

The above also applies to remissions during which the patient appears to have recovered. A remission is easily mistaken by the patient and his friends for a cure. An examination by a competent physician would frequently reveal the etiologic agent or disease was still present. Remission, mistaken for a cure, might easily be reported in the press as a miracle while the subsequent relapse received no publicity.

Investigation of the "cures" claimed for spiritual healing often reveals that the patient was receiving combined treatment, i.e., while receiving the spiritual ministrations the patient continued the treatment prescribed by a medical doctor. Obviously it is im-

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possible to evaluate the results in these cases. In many, the fact that medical treatment was also being given is not stated and emerges only on questioning and investigation. It may be that the patients in these cases believed in the old maxim, "Faith without works is dead."

The "cures" falling into these categories are obviously not miracles. They would be of significance only if all cases of divine healing were thus explainable. They are not.

The one or two miracles every year at Lourdes, the single cases in the series of Edwards¹¹ and Rose,⁴² and the few uncovered by the British Medical Association are not explained by any of the above. These investigators believed, however, that even these cures could be explained in terms of orthodox medical practice. Medical men not infrequently meet with illness which, on the basis of previous experience, should prove fatal but which appears to resolve unexpectedly. Such cures take place apart from medical or surgical treatment and without special ministrations of other kinds such as "spiritual healing." Stewart,⁵² Rae,³⁷ Rorburg,⁴¹ and Scott⁴⁶ are but a few of the many who have reported the spontaneous resolution of cancer.

Bashford⁵ estimates that one of every 100,000 cases of malignant tumors will undergo spontaneous regression. A slightly higher estimate is provided by Boyers,⁹ who feels that one in every 80,000 would be more accurate. (These figures might profitably be compared with those of Lourdes reported by Siegmund⁴⁹ for the year 1948, i.e., three cures out of 300,000.) Though cancer statistics cannot be applied to other diseases, it should be obvious that if a frequently fatal disease such as cancer can regress, so then can other less severe maladies. If severity is any criterion, one might even expect a greater incidence of spontaneous cure among the latter.

Rohdenberg,³⁹ who collected 302 cases, and Eversen and Cole,¹⁶ who reviewed 600 cases, have suggested certain factors that appear to play a role in the spontaneous regression of tumors. They are:

1. Local tissue reaction. The inflammatory response is an attempt at control.
2. Generalized immune response, i.e., an allergic reaction with destruction of malignant cells.
3. Infection with degeneration of the tumor. Necrosis with subsequent calcification is frequently seen.
4. Unexplained fibrosis.
5. Spontaneous maturation of malignant cells. Three such cases of neuroblastoma were reported by Stewart.⁵²
6. Interference with the blood supply or nutrition of the tumor. Vascular obliteration may be caused by the tumor or by incomplete surgical removal.

Hemorrhage into and obliteration of a small tumor have been reported by Stewart.⁵²

7. An acute febrile episode or infection. The heat of cautery may simulate fever. Fever of 104-105 degrees Fahrenheit for 48 to 96 hours was reported efficacious by Rohdenberg.³⁹

8. A profound metabolic alteration such as cachexia. It has been shown that animals in a poor state of nutrition are not good subjects for transplantation experiments.³⁹

9. Removal of carcinogenic agent. (The diversion of the urinary stream in carcinoma of the bladder.)

10. Unusual sensitivity to what is normally considered inadequate treatment.

11. Endocrine imbalance.

From their work it is apparent that a multitude of factors may be at work. "It is probable that many of the conditions noted are preliminary so to speak and act by depressing the proliferative energy of the malignant cell until the defensive forces of the body are able to accomplish the final destruction."³⁹ Regression, it was learned, may occur at any age, in either sex, and in any location. Reexamination of the as yet unexplained cures in the light of the above work might serve to remove some if not all from the sphere of the supernatural.

The British Medical Association, in summing up its report, had the following to say: "When all these possibilities are considered it leaves little room for miraculous cures of organic disease by the methods of spiritual healing. . . . As far then as our observation and investigation have gone, we have seen no evidence that there is any type of illness cured solely by spiritual healing which cannot be cured by medical methods which do not involve such claims. The cases claimed as cures of a miraculous nature present no feature of a unique or unexpected character outside the knowledge of any experienced physician or psychiatrist."¹⁰

Similar sentiment was expressed in the report of another committee in 1920, that of the Lambeth Conference. Their report read: "Our committee has so far found no evidence of any cases of healing which cannot be paralleled by similar cures wrought by psychotherapy without religion and by instances of spontaneous healing which often occur even in the gravest cases in ordinary medical practice."³⁸

The following statement by Hippocrates,²² the father of medicine, suggests that the above conclusions are not original in our time. He said: "Though physicians take many things in hand, many diseases are overcome for them spontaneously."

Carlson, as president of the American Association for the Advancement of Science, echoed this theme when he said: "Those who believe that ill health can be cured by prayer will pray. Those who believe



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that an amulet is a cure will apply the amulet. . . . Certain of these people will get well. The common error is in the patient's assumption that he recovered because of the treatment. The experience is correct, the conclusion is wrong. He is like the rooster who crows every morning before daybreak, notices that a little later the sun rises, and then concludes that it is his crowing which brings the sun above the horizon.

"Miracles of sufficiently recent occurrence so that fair information is available of the alleged facts and circumstances are resolved into misrepresentation and misinterpretation of the facts."¹⁴

Although investigators have gone essentially unrewarded in their search for a "miraculous cure" they hesitate to say that prayer, charms, oils, etc., have no value whatsoever. Their reluctance is certainly justifiable since it is well known that a certain number of patients are demonstrably benefited by belief in the supernatural. While an organic disease will not be cured, a patient is unquestionably helped if by some means his suffering is made more bearable, for example, if he is convinced that his torment will merit for him a greater reward in heaven. "After all, what is pain but sacrifice without love, and what is sacrifice but pain with love?"¹⁷

Miraculous Cures of Psychogenic or Psychosomatic Disorders

The second group of disorders, the psychogenic or psychosomatic, provides a more fruitful proving ground for the divine healers. The success they achieve with patients of this type is in striking disproportion to that demonstrated with patients suffering from organic disease. Is this then the evidence we have sought, i.e., is divine intervention the curative? Or is a more logical explanation available? Are we entertaining a hypothesis or is the hypothesis entertaining us? A critical analysis would appear in order.

It is well known definite physical phenomena can be caused by mental processes or emotion. Smith⁵⁰ and Strecker⁵³ have estimated fully 50 per cent of the problems of the acute stages of illness and 75 per cent of the difficulties of convalescence have their primary origin not in the body, but in the psyche of the patient. Afflictions of this type we label functional. The line between functional and organic is an artifact since the persistence of a functional disorder may lead to an organic lesion, for example, a peptic ulcer.

Other examples of the interrelationship of mind and body are well known. Anger may cause a rise in blood pressure; fear, a drop in blood pressure; pity may produce tears; excitement, insensibility to pain; terror, paralysis; fear, urination. Disappoint-

ment, frustration, discord, suppressed anger, hatred, or jealousy may be somatically manifest as pain, paralysis, blindness, indigestion, palpitation, or a convulsion. This being so, any form of therapy directed at the removal of the cause is apt to be beneficial.

Others such as the British Medical Association have voiced similar conclusions. In their report they state: "Disorders of psychological origin may be cured by many methods of treatment affecting the patient's mind and emotional state and these may include spiritual healing, the laying on of the hands, and unction, as well as forms of analytical treatment and suggestion or hypnosis. Some of these methods direct themselves simply to the abolition of the symptom, such as the removal of pain or a hysterical paralysis, others aim at discovering some of the causes and the meaning of the illness and by allaying the anxiety, may cure the patient more radically and permanently. Relief of psychogenic disorders appears to depend partly on the individuality of the patient and his capacity to respond, partly on the personality of the healer and his power of suggestion and to some extent on the method employed."¹⁰

Here then may be the explanation of the effect of various procedures, religious, magical, or psychological, i.e., they act by extracting some source of disharmony, or by instilling the belief that it will be removed. The latter is faith. Have we evidence to support this statement? Valid evidence is to be found in the words of Christ, Buddha, and St. James, as well as other advocates of divine healing. All the examples of miraculous healing recorded in the Christian Scriptures show that unswerving faith on the part of the sufferer was an essential pre-condition.³⁰

Buddha,¹² about to cure a blind man said: "According to thy belief, be thou healed."

Even St. James says: "And the prayer of faith shall save the sick man"; He does not say, "And God shall save the sick man." Whether intentional or not, these statements when considered with others suggest that even these great "healers" realized how their cures were achieved.

Sir William Osler³⁵ also indicated considerable insight when he said of religion: "It will not raise the dead; it will not put in a new eye or knit a bone; but the healing power of belief has great value when carefully applied in suitable cases."

The inclusion by Sherwin⁴⁸ in his pamphlet *Prayers for Hospital Days* of a special prayer for faith indicates that he too appreciates the catalytic action of faith.

Since faith in an end is often instrumental in the production of that end, it would appear that faith has

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a function somewhat like the proverbial bootstrap. Faith is admittedly the active component of the placebo. Faith endows drugs or treatments with powers which they themselves do not possess and is the strongest argument for the validity of placebo therapy.¹⁸ Could it be that spiritual ministrations are just another variant of our familiar ally, the placebo? The possibility is deserving of consideration.

Placebo is of Latin derivation and literally means, I shall please. Gradual modification of the original meaning has led to the current definition, i.e., any preparation or treatment which has no inherent pertinent activity, but which is effective only by virtue of the factor of suggestion attendant upon its administration.³¹ A placebo is thus nothing more than a convenient and concrete form of suggestion.²³ Are not the above definitions applicable also to prayer, charms, and holy oils?

To those readers who are angered by this comparison I would quote Huston who says: "Often enough doctors of little critical discrimination come to believe in the placebo just as their faith is able to impart to the patient the faith that heals and the faith seems justified by its fruits. Such men argue hotly for their placebos since it is a well known trait of character that ire is engendered by matters of faith not by matters of demonstration; men fight for a belief, not for a statistical deduction. These are they that loudly affirm, 'thou shalt have no other placebos before mine,' and pursue with bitterness the alien placebo mongers of another cult."²⁴

Over the years, placebos have been shown to have an average significant effectiveness of 35.2 per cent.^{6, 7, 25} When used on a select group of patients with psychogenic disorders, the effectiveness is increased almost twofold, i.e., to 60.0 per cent. Thus, any therapeutic response of 35 per cent or less is logically insignificant. A response of 60 per cent or greater in the treatment of migraine, peptic ulcer, paroxysmal tachycardia, hypertension, Raynaud's disease, or ulcerative colitis is required before an agent can be considered to have pertinent activity.²⁸ The placebo which both the physician and the patient believe in is demonstrably the most effective. If the patient believes in it strongly enough, a placebo is often as effective as an active drug.

Wolf⁵⁴ demonstrated that measurable placebo effects could even be obtained with pharmacologically active agents such as atropine or benadryl. He used a patient with a large gastric fistula and was able, after suitable conditioning with prostigmine, to show that the placebo effect of atropine could even cancel out its usual pharmacologic action; the atropine, instead of inhibiting, produced hyperemia, hyperacidity, and hypermotility in the stomach. Ob-

viously the placebo should never be underestimated. Certain patients may even become "dependent" on a particular placebo, necessitating its withdrawal.¹⁵

As previously noted in our evaluation of miraculous cures of organic diseases, the efficiency of spiritual ministrations does not approach the 35 per cent effectiveness of a placebo. Nor are prayer, suggestion, or relics more than 60 per cent efficient in the treatment of psychosomatic disorders. The response to spiritual ministrations would thus appear to be that of a placebo.

There is a particular psychologic set which predisposes to anticipation of pain relief and thus to a positive placebo response. Placebo reactors have been extensively examined by Lasagna et al.²⁸ Psychological data was obtained on these patients, the data tabulated, and various interesting characteristics brought to light. Placebo reactors tend to be active churchgoers, more emotionally expressive and labile than non-reactors, and more dependent on outside stimulation than on their own mental processes. They take more medications, have less formal education than non-reactors, and have less mature mental processes.²⁸ (The first of the above suggests a possible corollary, i.e., if reactors tend to be active churchgoers, or "veritable pillars of the church" as Lasagna²⁹ describes them, do churchgoers then tend to be placebo reactors?)

Psychological testing of the recipients of "miracles" would be required to prove their semblance to placebo reactors. Obvious similarities are nevertheless apparent. Until evidence to the contrary is presented, religious ministrations must logically be considered placebos. As such they are no less valuable, and their mode of action is made readily apparent. We should have some knowledge of the agents we employ. What is there about faith, the active ingredient of a placebo, especially religious faith, that makes it potent therapeutically?

Any understanding of faith must of necessity begin with an appraisal of its substrate, i.e., the patient. What does it mean to be sick? Cabot says: "To be sick is to be a stranger, naked, stripped of vigor, weakened by lack of determination, feverish, helpless, bared by broken confidence, to wear a queer abbreviated gown. It is haunting fears and imaginings, the taking of an anesthetic, the post operative discomforts. To be sick is to face the uncertainties of diagnosis, the loneliness of convalescence, the difficulties of facing life as a cripple or an invalid. To be sick is to be in prison, imprisoned in one bed, one room, one ward, one building; imprisoned with one's helplessness and one's handicaps, chained to the threat of death."¹³

Helplessness and psychologic dependence are universal, ever present symptoms in illness or injury.

Eighty-seven patients with various infections of the skin were treated over period of six weeks with [Signemycin]. Excellent or good results were achieved in sixty-seven, including even of twenty-two patients refractory to other antibiotics."

Wis, H. H.; Frumess, G. M., and Umschel, E. J.: *Rocky Mountain M. J.* :306 (Aug.) 1957.

Results of treatment with oleandomycin-tetracycline of 50 infections [mostly respiratory] due to resistant organisms and 40 infections [respiratory, skin, urinary infections] due to sensitive organisms are very encouraging. In some of these patients, Signemycin was lifesaving, and in others surgery was made unnecessary. This confirms other reports."

Ubin, H.: *Antibiotic Med. & Clin. Therapy* 4:174 (March) 1957.

Based on case reports documented by independent investigators in 26 countries abroad, the clinical response obtained with Signemycin in 1404 patients with a wide variety of infections was successful in 1329 patients; in 13 cases only was it necessary to discontinue therapy because of side effects.

Report on 1404 Cases Treated with Signemycin: Medical Department,

Pfizer International. Available on request.

In 50 nonselected patients, Signemycin "...appears to be effective in the treatment of most general surgical infections, including virulent staphylococcus aureus infections. In some cases these infections had been clinically resistant to other antibiotics. The drug is apparently well tolerated."

Levi, W. M., and Kredel, F. E.: *J. South Carolina M. A.* 53:178 (May) 1957.

Of 50 patients with various infectious processes, 26 had not responded to previous antibiotic therapy. With Signemycin "Ninety-six per cent of the mixed infections were clinically controlled. . . . and in none of the cases was there any reason to discontinue the drug."

Winton, S. S., and Chesrow, E.: *Antibiotics Annual 1956-1957*, New York, Medical Encyclopedia, Inc., 1957, p. 55.

Signemycin in 79 patients with severe soft tissue infections: "The average response of these cases was excellent and inflammatory symptoms subsided with almost uniform rapidity.... The magnitude and incidence of surgical intervention was reduced.... Side reactions were minimal. . . ."

LaCaille, R. A., and Prigot, A.: *Antibiotics Annual 1956-1957*, New York, Medical Encyclopedia, Inc., 1957, p. 67.

Five groups of patients (total 211) with acne were treated with one of five antibiotic agents, including Signemycin (55 cases). "The results were evaluated taking into consideration the usual response to such conservative conventional therapy and the rapidity of response." In 8 weeks, Signemycin rapidly attained and maintained the highest percentage of efficacy of antibiotic agents tried.

Frank, L., and Stritzler, C.: *Antibiotic Med. & Clin. Therapy* 4:419 (July) 1957.

In the treatment of 78 patients with tropical infections, some complicated by multiple bacterial contamination or present for years, Signemycin was found to be "...an exceptionally effective agent," requiring smaller doses and less extended periods of therapy than with the tetracyclines alone, and "caused no notable toxic reactions."

Loughlin, E. H., and Mullin, W. G.: *Antibiotics Annual 1956-1957*, New York, Medical Encyclopedia, Inc., 1957, p. 63.

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They are in effect manifestations of regression brought about by the similarity between the patient's present feelings and those he experienced as an infant.⁴⁰ "From the personal dependency of the infant emerges the religious dependency of the adult."¹⁷ This is the normal sequence of events that during illness is reversed. The mother and father are responsible for life, nourishment, and sustenance during the period of biological immaturity, and when the patient regresses to this level he resorts to the use of childlike techniques of thinking, feeling and behaving. He again seeks a parent figure.

The identification of the physician as a father figure is the prerequisite of a good doctor-patient relationship. The engendered trust, confidence, or faith enhances any treatment and is the very essence of the placebo. If instead of the physician the transference is to a "universal mother" such as Mary, or an all loving, divine father, the resultant confidence and strength are correspondingly enhanced.⁸

Evidence to this effect is found in the story related by Schweisheimer⁴⁵ of a timid soldier who besought one of his fellows to obtain for him an amulet or charm to protect him in battle. The friend wrote three times on a scrap of paper "Hit back you coward," enclosed the paper in a small silver ball, and sold it to his friend for a high price. The recipient thereupon boasted he was bulletproof, acted accordingly in battle, and was later decorated for his great courage.

A strong unbroken transference to a parent substitute is one of the main factors in the cure of the sick. A period of preparation, whether it be prayer, suggestion, confession, a pilgrimage, or an elaborate ceremony, aids greatly in the transference.⁸ Reverend Speers says of prayer: "There is no magic about prayer. The matter of praying for the sick is only another manner of creating the atmosphere of faith for the sake of the patient."⁸

The period of preparation or "atmosphere of faith" of which Speers speaks is provided at Lourdes by factors inherent in a pilgrimage, elaborate ceremonies, and the shrine itself. The altar, the veritable forest of candles, the crutches and surgical appliances covering the walls, the candlelight processions with their smoking censers, singing, chanting, and praying, all combine to produce an adequate "atmosphere of faith." The period of preparation that will catalyze the desired transference is thus provided.³³ The preparatory value of suggestion and confession is readily apparent.

Conclusion

I find no evidence that there is any type of organic disorder cured by spiritual means which could not have been cured by medical treatment. The evidence

suggests that such cases claiming to be cured are likely to be instances of wrong diagnosis, wrong prognosis, alleviation, remission, the result of combined treatment, or possibly spontaneous remission. The small number of cases that could not be thus explained was, in every series, statistically insignificant.

Persons suffering from psychogenic or psychosomatic disorders may be "cured" by various methods of spiritual healing, just as they are by suggestion and other forms of psychotherapy.

Spiritual ministrations, like other placebos, have no demonstrable pertinent activity and are effective by virtue of the factor of suggestion. The transference to a parent substitute is a sequel of regression and is enhanced by suggestion, faith, or a variety of preparatory measures. Transference supplements the patient's waning self-confidence and is thus conducive to healing.

Let us not fall into the error of thinking that because a thing is unknown it is unknowable, but remember that as the miracles of yesterday are the commonplace of today, so the mysteries of today may be the common practice tomorrow. "The sword of logic will in time pierce the shield of conviction."⁴

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When you educate a man you educate an individual; when you educate a woman you educate a whole family.—*Charles D. McIver.*

New Medical Research Foundation

A new non-profit foundation has been established to support and stimulate research, clinical, and educational programs in Tay-Sachs' disease and allied heredo-familial, neuro-degenerative diseases of infancy and childhood. The scope of the program will include, in addition to Tay-Sachs' disease, Niemann-Pick's disease, infantile Gaucher's disease, Schilder's disease, diffuse sclerosis, amyotonia congenita, Friedreich's ataxia, and others. The foundation is known as National Tay-Sachs Association, Inc., New York Chapter, and is composed of parents who have had afflicted children, interested laymen, and medical personnel in the field.

The foundation is cooperating with the existing clinical and research program on Tay-Sachs' disease and certain of these allied diseases at Jewish Chronic Disease Hospital in Brooklyn, New York. The hospital is conducting a clinic for outpatient care of afflicted children and is constructing a special ward for the care and observation of inpatient cases. Both programs are being conducted in conjunction with the laboratory research program of the Isaac Albert Research Institute of the hospital. A comprehensive genetic study is also being made of the pertinent hereditary patterns from histories supplied by the foundation and parents who have children under the care of the hospital. A counseling program is also offered.

The operation of the foundation is on a nationwide basis, and contact is being made for establishment of chapters in other metropolitan areas, in addition to the allied Tay-Sachs Association in Philadelphia. In order to further its work and to prepare a substantial genetic study covering the entire country, physicians and hospitals are requested to make the existence of the foundation known to parents of children afflicted with these diseases.

Further information on the foundation and its work is available from Medical Committee, National Tay-Sachs Association, Inc., New York Chapter, P.O. Box 1250, G.P.O., New York 1.

Social Welfare

(Continued from Page 827)

the state divisions know that the counties are capable of handling all the aspects of the welfare and institutional programs, it is possible to return more citizens to their home communities.

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PHYSICIANS' ACTIVITIES

Dr. H. H. Loewen and **Dr. Frances Schiltz**, Wichita, were panelists who discussed "Medical Headlines Around the World," at a recent meeting of the Woman's Auxiliary to the Sedgwick County Medical Society.

The story of the growth and services of the University of Kansas Medical Center was told by **Dr. W. Clarke Wescoe**, dean of the school, before a recent meeting of the Kiwanis Club in Iola.

Dr. John F. Cornely, Aberdeen, South Dakota, has announced plans to begin practice in Osborne on December 1. A graduate of Temple University School of Medicine, Philadelphia, in 1950, Dr. Cornely served his internship at Fitzsimons Hospital in Denver and remained there for a residency in obstetrics and gynecology.

Dr. Samuel Zelman, Topeka, is the author of a paper, "Implantation Metastasis after Needle Biopsy of Liver Tumor," published in the October 12 issue of the *Journal of the American Medical Association*.

Honorary membership in the Kansas Chiropody Association has been conferred on **Dr. Oscar W. Davidson**, Kansas City.

Dr. Alfred M. Tocker, Wichita, spoke on "Recent Advances in Cardiovascular Surgery" at a meeting of the Butler County Medical Society last month. He had previously addressed the Barton County Society on the subject of "Blood Vessel Grafts and Cardiac Arrest."

"Rehabilitation of the Aged" was the subject discussed by **Dr. Donald L. Rose**, of the University of Kansas Medical Center, at a recent meeting in Emporia sponsored by the Lyon County Welfare Department. He spoke on the same subject at a meeting of the Council of Social Agencies in Topeka on November 5.

Dr. Dale L. Clinton, a 1954 graduate of the University of Kansas School of Medicine who has been practicing in Lakeland, Florida, has announced plans to move to Lawrence to practice in association with **Dr. Ray A. Clark**.

Fellowship in the American Medical Writers' Association was conferred recently on **Dr. Karl A. Menninger**, Topeka.

Dr. George W. Morgan, Savonburg, who has been in practice for 61 years, in Savonburg for 40 years, was the subject of a feature story in the *Humboldt Union* on November 7. Although he is almost 89 years of age, he maintains an active practice, drives a car, and pursues a hobby of sketching when time permits.

"Parsonian of the Week" is the title conferred on **Dr. John P. White** in a recent issue of the *Parsons Sun*. The newspaper carried a feature story on his professional and civic activities and hobbies in its October 19 issue.

Dr. Maurice F. Stock, Pittsburg, became a diplomate of the American Board of Otolaryngology recently.

A paper on "Psychosomatic Problems in Gynecologic Practice," written by **Dr. Jerome S. Menaker**, Wichita, was published in a recent issue of *Obstetrics and Gynecology*.

Dr. G. O'Neil Proud, of the University of Kansas Medical Center, was one of the speakers at the assembly of the Omaha Mid-West Clinical Society last month.

A talk on influenza was given by **Dr. Victor Henry**, Newton, before a recent meeting of the Kiwanis Club in his city.

Dr. J. Philip Berger, Wichita, was named director of the American Cancer Society from Region 8 by delegates to the society's annual meeting in New York last month. The region includes Kansas, Missouri, Arkansas, Oklahoma, and Texas.

"Evaluation of Community Needs for Hospital Facilities" was the subject chosen by **Dr. Thomas R. Hood**, secretary of the Kansas State Board of Health, for presentation before a meeting of the National Joint Commission for the Improvement of the Care of the Patient. The meeting was held in New York City.

Dr. Werner Brauer, a diplomate of the American Board of Surgery, has accepted appointment as chief of surgical service at the Veterans Administration Center in Leavenworth. A native of Germany and



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now a citizen of this country, Dr. Brauer received his medical education from New York University College of Medicine, served three years in the Army during World War II, and completed a four-year residency at the New York Veterans Hospital before becoming clinical assistant professor of surgery at the Albert Einstein College of Medicine in New York.

COUNTY SOCIETIES

Members of the Miami County Society were guests at a meeting held at the Osawatomie State Hospital last month. The program concerned the history of the institution, its present methods of treatment, and plans for the future. Speakers were Mr. Blake Williamson, Kansas City, and Dr. George Zubowicz, superintendent of the hospital. Also present were Dr. George Jackson, director of state institutions, Topeka; Dr. Frank V. Smith, assistant director; Mr. George Dixon of the State Department of Social Welfare; Mr. Robert Nichols, director of social welfare programs in Miami County, and Mr. Robert Jones, administrator of the Miami County Hospital.

Dr. Leonard F. Peltier, professor of orthopedic surgery at the University of Kansas Medical Center, spoke on "Metastatic Bone Disease and the Management of Pathological Fractures" at a meeting of the Sedgwick County Society in Wichita on November 5. For an afternoon clinic preceding the meeting Dr. Ward McClanahan served as moderator.

A meeting of the Wyandotte County Society was held at the University of Kansas Medical Center on November 19. The program consisted of presentation of two papers, "Treatment of Hepatic Coma with Arginine," by Dr. Robert T. Manning, Dr. Mahlon Delp, and Dr. Robert W. Brown, and "Modifying Effect of Serum from Schizophrenic Patients on the Topic Action of Epinephrine on the Cerebral Cortex of Rabbits" by Dr. E. J. Walaszek and Dr. B. Ming. During a business session the group discussed proposed amendments to its constitution and by-laws.

The Cowley County Medical Society and its auxiliary held a joint dinner session at the Winfield Country Club on October 17. Later Dr. D. Cramer Reed, Wichita, addressed the physicians on the subject of urological conditions.

Dr. David E. Gray was installed as president of the Shawnee County Society at a meeting held in Topeka on November 4. Elected to serve with him during 1958 are the following: Dr. Clovis W. Bowen, president-elect; Dr. William O. Martin, vice-president; Dr. Bartlett W. Ramsey, secretary, and Dr. John A. Segerson, treasurer. Newly chosen for service on the board of directors is Dr. James A. McClure. Dr. Richard R. Beach and Dr. Howard U. Kennedy were elected to the medical service board, and Dr. Francis T. Collins was named to the board of censors.

ANNOUNCEMENTS

The University of Kansas School of Medicine 13th annual postgraduate course in surgery, January 20, 21, 22 and 23, 1958, at the University of Kansas Medical Center. Designed to interest the general surgeon and the surgical specialist and also the general practitioner who includes surgery in his practice. General considerations in the program: Treatment of Accidentally Incurred Injuries, Changing Concepts of Surgical Treatment, Surgical Management of Cancer, and Gastrointestinal Bleeding.

Registration fee \$60. Further information obtained by writing the Department of Postgraduate Medicine, University of Kansas School of Medicine, Kansas City 12, Kansas.

Two-day postgraduate course in gastroenterology, January 15 and 16, University of Kansas Medical Center. Informal symposium and panel method of presentation. Panels include surgeons and internists.

Pulmonary disease clinic, January 13 and 14, Kansas City. Monday program at University of Kansas Medical Center. Tuesday sessions at Kansas City Veterans Administration Hospital. Faculty includes Dr. Kenneth T. Bird, Harvard Medical School, Dr. Edward A. Gaensler, Harvard Medical School, and Dr. Gardner Middlebrook, University of Colorado. Registration fee \$30. Write Department of Postgraduate Medicine, KUMC, Kansas City 12, Kansas.

Next scheduled examinations (Part II) of American Board of Obstetrics and Gynecology, May 7-17, 1958, Chicago. Information available from Secretary of Board, 2105 Adelbert Road, Cleveland 6, Ohio.

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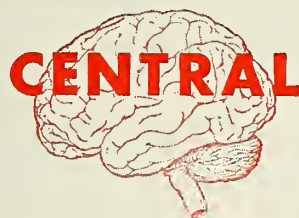
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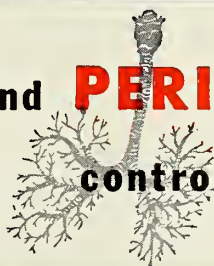
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Twenty-first annual meeting, New Orleans Graduate Medical Assembly, March 3-6. Post-clinical tour to Mexico, leaving New Orleans March 7.

University of Colorado Medical Center postgraduate course, General Practice Review, January 13-18. Medicine, Monday; Pediatrics, Tuesday; Surgery, Wednesday; Laboratory Medicine and Radiology, Thursday; Obstetrics and Gynecology, Friday; Trauma, Saturday. Write 4200 East Ninth Avenue, Denver 20, Colorado.

BOOK REVIEWS

Clinical Toxicology of Commercial Products—Acute Poisoning (Home and Farm). By Marion N. Gleason, Robert E. Gosselin, and Harold C. Hodge. Published by Williams and Wilkins Company, Baltimore. 1160 pages.

This most authoritative text is composed of seven sections which are differentiated by color. The subject matter is indicated in the operational chart which is the book's frontispiece. This is a graphic single page demonstration of the efficiency of this volume.

Section I contains general principles of first aid and emergency treatment. The information contained herein is most useful when the ingredients of the potentially poisonous product are unknown. Quite obviously many of the procedures outlined may be profitably employed when the poison is known.

Section II is a list of every compound known to be a pertinent ingredient in widely known consumer products. These substances are described, commercial use indicated, pharmacological action stated, and relationship to other compounds toxicologically emphasized. The latter information is quite useful for with this knowledge reference to Section III permits a rapid formulation of a specific therapeutic program. Also the compounds are rated against a toxicity scale in order that an immediate estimation of the importance of the problem at hand can be made.

Section III constitutes the heart of the volume. Here are listed the classes of compounds which are

involved in the problem of poisoning by ingested or inhaled substances. Each description includes the subheadings of toxicology, symptomatology, treatment, and pertinent laboratory findings.

Section IV is composed of a series of descriptions of supportive measures that are most appropriate for cases of chemical poisonings. Physiological changes in each organ system, such as the respiratory or circulatory systems, etc., are minutely examined. This section should be of general interest to any therapist in any medical problem, and it is replete with fine suggestions for good patient management. The authors feel that most often good supportive treatment is more important than the "correct" antidote in the final analysis.

Section V is the largest of the seven, for this is the bulk of the text. Here are recorded over 15,000 trade name products which might be accidentally or intentionally consumed around the farm or home. The ingredients by percentage composition, if known, are listed, as well as the manufacturer's name. If the ingredients are not recorded, direct communication with the manufacturer is recommended.

Section VI is a list of general formulation of products. Inspection of this informational list reveals what more or less must be in a product in order for it to accomplish its assigned task. When even the name of the ingested product isn't known, but its use is, this section may be invaluable.

Section VII is the list of the manufacturers referred to in Section V and completes the format of this excellent book.

The authors realize that such a volume cannot forever remain complete with new products appearing daily, so they have elected to combat this inherent deficiency by the publication of periodic supplemental lists.

The reviewer feels that the authors are to be highly praised for this monumental contribution. Every pediatrician and general practitioner should have this text in his library.—T.C.H.

Introduction to Anesthesia—The Principles of Safe Practice. By Robert D. Dripps, James E. Eckenhoff, and Leroy D. Vandam. Published by W. B. Saunders Company, Philadelphia. 266 pages. Price \$4.75.

Introduction to Anesthesia stresses the principles of safe practice. Fundamental aspects with basic consideration of the drugs used in anesthesia have been presented in a clear, concise, and intelligible form. The content is divided into the four principal phases of the anesthetic management of the patient.

Part I devotes itself to the preanesthetic periods and is presented in four chapters condensed into 17

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pages. A careful inquiry into prior ingestion of drugs, i.e., cortisone, digitalis, reserpine, chlorpromazine, insulin, etc., is mandatory. Anesthesia, being a consultant practice, stresses the importance of a careful history and physical evaluation. In short, "Each specialist is expected to contribute to the patients' well being with his special fund of knowledge."

Part II concerns the "Day of Anesthesia" and is presented in 11 chapters or 98 pages. This section stresses the care of the patient during anesthesia and, "A safe anesthetic can be given only if thoughtful preparations are made." Chapter 9 briefly reviews the physiology of respiration and circulation as they are affected by the anesthetic.

Part III, "During Operation," comprises six chapters and 50 pages and discusses the importance of adequate records and causes of complication during anesthesia. Chapter 22, page 175, pertaining to surgeon-anesthetist relationship, should be read by all physicians. "Confusion often exists in the minds of surgeons and anesthetists alike as to medico-legal responsibility in anesthesia. A study of court rulings indicates that a surgeon is responsible for the anesthetic only if it is administered by a technician under his direction. If the anesthetic is given by an anesthesiologist, he is legally responsible for the choice of agent and the care of the anesthetized patient."

Part IV, "The Postoperative Period," is condensed into four chapters of 23 pages. The part dealing with hazards of the immediate postoperative period is particularly illuminating.

In Part V special topics are covered in eight chapters of 46 pages. The chapter on obstetric anesthesia (Chapter 30) and infant resuscitation is excellent. The occasional anesthetist would benefit from reading this chapter. Chapter 31 is devoted to the management of narcotic poisoning, whereas more rightly it could be called the management of the comatose patient. Chapter 33 stresses the importance of carefully preparing death reports. The careful preparation of such a report is of great educational value.

This book is well written, pertinent, and contains information of factual importance. It should be read in a leisurely manner by all physicians practicing the art and science of medicine.—*P.H.L.*

Modern Perinatal Care. By Leslie V. Dill. Published by Appleton-Century-Crofts, New York. 309 pages. Price \$6.50.

This is not an obstetrical textbook but, as the name implies, is an extremely well written treatise covering pregnancy and all of its potential problems—physical, psychological, and even medico-legal-moral. Dr. Dill, himself an able clinician at Georgetown School of Medicine, has further enhanced his work by obtaining

the opinions of other leaders in this specialty as well as advice of legal and moral authorities of national standing.

Sixteen chapters, well-written, concise, and clearly understood, range from signs of early pregnancy to the postpartum period. Charts and diagrams are used to further clarify many subjects. The most recent opinions in reference to hygiene, nutrition, pelvic measurements, toxemia, and anemia are considered. Medical complications—heart disease, diabetes, thyroid abnormalities, tuberculosis and venereal disease—are brought up to date.

The psychology of pregnancy is well handled, as are the chapters on care immediately after delivery, fetal and neonatal mortality and Rh problems. Such adjunct matters as infant feeding and obstetrical records are briefly covered.

The last two chapters are most interesting, on subjects rarely so thoroughly discussed. Legal problems in obstetrics are handled expertly by Professor O'Connell of Georgetown Law School. Ethics of the Catholic Church, in whose hospitals so much of obstetrics is practiced, are set down by three leaders of the clergy.

This book is a must for all obstetricians and perhaps it is even more valuable for the busy general practitioner, for the most modern features of handling all obstetrical problems except the actual technique of delivery are clearly set forth.—*E.X.C.*

VA Rehabilitation Program

A treatment devised to rehabilitate severely disabled older patients is producing promising results, Veterans Administration reports. Patients were victims of strokes, hardening of the arteries, arthritis, or multiple sclerosis. After receiving maximum benefits from medical and surgical treatments, they were placed in special rehabilitation wards where an individual program was planned for each, under direction of a psychiatrist. Among other treatments, physical and corrective therapists used exercises to restore the patients' strength and coordination. At one hospital 50 of the 60 aged patients progressed enough to be discharged; at another 25 of the 130 left the hospital for jobs, 40 others were discharged, and 55 showed worthwhile permanent improvement.

Heart disease is apparently more prevalent among women than men, Health Information Foundation points out—but it causes 75 per cent more deaths among the males in this country. One possible explanation of the excess male mortality: Men are thought to be particularly subject and vulnerable to the strains and pressures of modern life.

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Increasing Health Insurance Coverage

More than \$3 billion—a rate of nearly \$10 million per day—of the nation's health care bill will be paid in 1957 through voluntary health insurance programs, according to the Health Insurance Council.

This estimate was made by the council on the basis of results of its annual survey of health insurance coverage in the United States for 1956. Benefit payments to help cover the cost of hospital, surgical, and medical care last year amounted to \$2.9 billion, an all-time high.

The council, in a projection of its 1956 figures on health insurance coverage in the United States, estimates that as of May 1, 1957, some 118 million persons were protected against the cost of hospital expenses through voluntary health insurance programs, 103 million were covered for surgical expenses, 67 million had policies covering regular medical expenses, and 10 million were insured against major medical expenses. These figures mean that over 70 per cent of the total U.S. civilian population today is protected by some form of voluntary health coverage.

The survey, which is made annually, covering the period from January 1 through December 31, is based upon reports of health insurance programs conducted by insurance companies, Blue Cross-Blue Shield, and other health care plans.

The council reported that insurance companies in 1956 paid a total of \$695 million in benefits to people through loss of income insurance policies, which help replace income lost because of accident or sickness. This figure, added to the \$2.9 billion paid in other health benefits, would bring the total benefit payments for the year 1956 to \$3.6 billion paid under health insurance programs.

Advances in all types of health insurance coverage were revealed in the council report. During the year, the number of people covered by hospital care insurance rose by 8 million over the year before, the number of people covered by surgical expense insurance

increased 9 million, and persons covered for regular medical expenses rose 9 million.

Hospital care insurance, to help pay for services in the hospital, remained the most popular form of health insurance in terms of number of people covered, with 66,259,000 persons holding policies from insurance companies; 53,162,000 enrolled by Blue Cross-Blue Shield; and 4,654,000 protected

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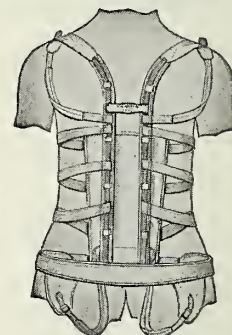
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*REFERENCE: J.A.M.A. 163: 359, 1957 (February 2)

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through miscellaneous plans. Making allowance for people covered by more than one type of insuring organization, the council reported that over 115.9 million persons were protected by hospital expense insurance.

Surgical expense insurance, which helps meet the cost of operations, was provided by insurance companies to 62,996,000 persons; 42,570,000 by Blue Cross-Blue Shield; and 4,909,000 by the other health care plans. Allowing for those with duplicate health insurance coverage, the survey found 101.3 million persons protected against surgical costs.

Regular medical expense insurance, providing for doctor visits for non-surgical care, accounted for 33,907,000 persons through Blue Cross-Blue Shield; while 29,756,000 were covered by insurance company programs; with 5,276,000 persons insured under the miscellaneous plans. The unduplicated total number of persons having regular medical expense protection was 64.9 million.

Major medical expense insurance, which helps to absorb the cost of serious, or catastrophic illness, continued its dramatic upward trend at year's end, the survey further disclosed. Coverage through insurance companies under all forms of major medical programs rose to 8,876,000 persons. Of these, 8,294,000 had protection through group policies, with the remaining 582,000 insured through individual and family major medical expense policies.

The report, as presented by the Health Insurance Council, which is a federation of leading insurance associations representing over 90 per cent of the health insurance in force through insurance companies, is the 11th annual review of the extent of voluntary health insurance coverage in the United States.

Cancer Conference in March

The 10th annual Midwest Cancer Conference will be held at the Hotel Broadview, Wichita, March 13 and 14, 1958, according to announcement made recently by the Kansas Division of the American Cancer Society. Guest speakers from over the nation have agreed to take part in the program, and the committee in charge, headed by Dr. D. Cramer Reed of Wichita, promises a course of interest to all physicians.

New Directory in September

The new 20th edition of the American Medical Association directory, containing data on 260,000 physicians in the United States and Canada, is now going to press and will be available for purchasers on September 1, 1958. For orders received at A.M.A. directory headquarters before January 1, 1958, the cost will be \$30. After that date the cost will be \$35.



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